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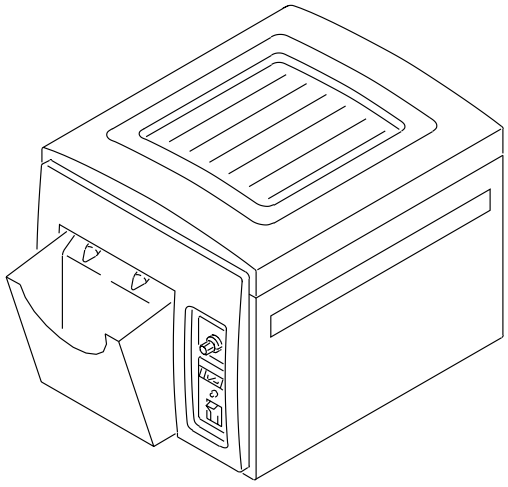
SERVICE MANUAL
for the
Kodak X-Omat 2000 PROCESSOR
Service Code: 3554
and the
Kodak X-Omat 2000A PROCESSOR
Service Code: 3555



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HEALTH IMAGING

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Warning

To avoid hazardous conditions, keep floors and floor coverings around your *Kodak X-Omat* Processor and associated drains clean and dry at all times. Any accumulation of fluids from mixing tanks, drain lines, etc., should be cleaned up immediately. In the event of an accumulation of liquid due to backup, overflow, or other malfunctions of the drain associated with your *X-Omat* Processor, call a plumber or other contractor to correct any problem with the drain. Kodak accepts no responsibility or liability whatsoever for the serviceability of any drain connected to or associated with a *Kodak X-Omat* Processor. Such drains are the sole responsibility of the customer.

Radio Interference

Caution

This equipment generates, uses, and can radiate radio-frequency energy. If the equipment is not installed and used according to the instructions, it may cause interference to radio communications. The equipment has been tested and found to comply with the limits for a *Class A* computing device pursuant to Subpart J of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at the user's own expense will be required to take whatever measures may be required to correct the interference.

This digital apparatus does not exceed the *Class A* limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

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Section 1: Introduction

Electrostatic Discharge

ESD - Electrostatic discharge - is a primary source of:

- product downtime
- low productivity
- costly repairs

While one cannot feel a static charge of less than 3,500 volts, as few as 30 volts can damage or destroy essential components in electronic equipment.

Preventive Measures

- Always look for an ESD warning label before doing any procedure involving static-sensitive components such as CIRCUIT BOARDS. All static-sensitive components are marked with bright graphic labels which frequently include instructions. Follow all label instructions.
- Wear a GROUNDING STRAP when handling static-sensitive components. Always be sure that the CLIP remains attached to a properly grounded, unpainted, clean surface.
- Repair static-sensitive components at an ESD-protected work station or use a portable GROUNDING MAT. For help in setting up an ESD-protected work station, contact your Kodak representative.
- When moving static-sensitive components from one area to another, insert and transport the components in ESD-protective packaging.

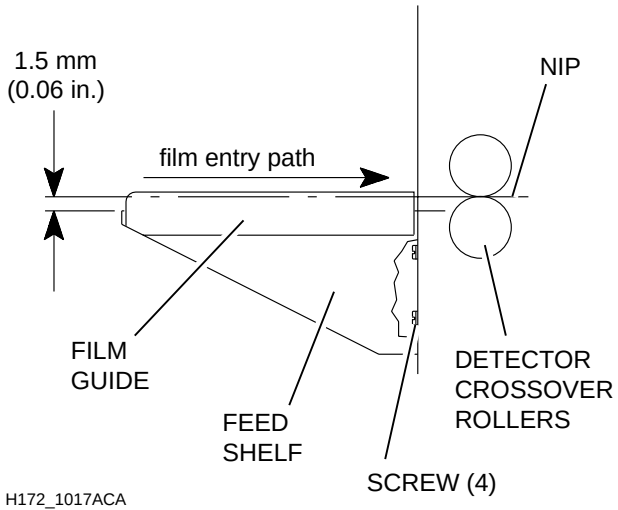
Special Tools

- SEALANT TL-3230
- MOTOR OIL, 1 oz TUBE TL-2244
- MOTOR OIL, 12 oz TUBE TL-2324
- POTENTIOMETER ADJUSTING TOOL TL-1481
- THERMOMETER 716217

Section 2: Adjustments and Replacements

FEED SHELF

Adjustment



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[1] Loosen the 4 SCREWS.

[2] Adjust the height of the FEED SHELF to 1.5 mm (1⁄16 in.) below the NIP of the DETECTOR CROSSOVER ROLLERS.

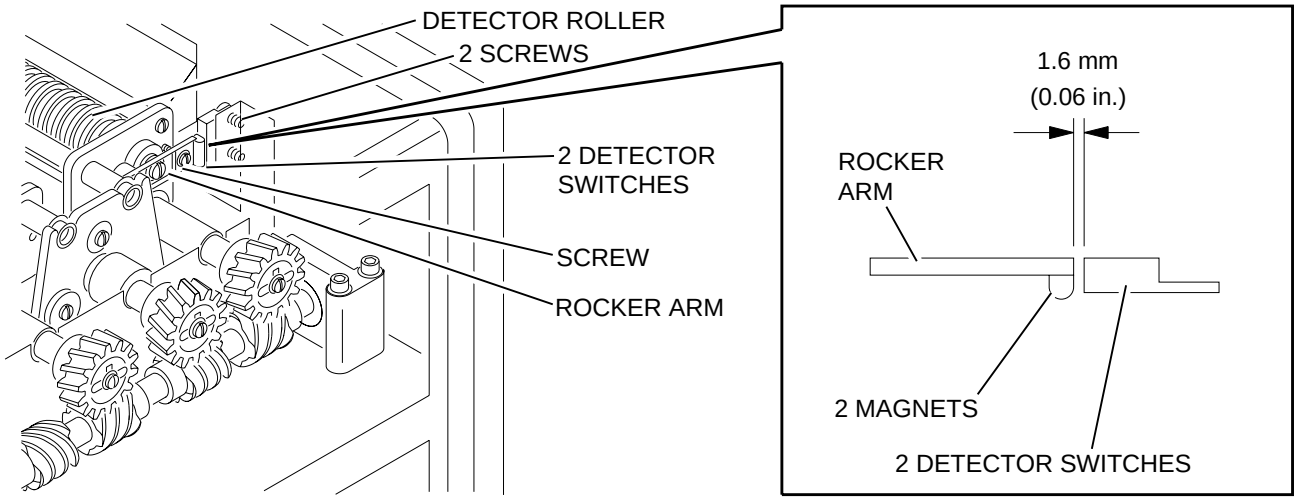
[3] Insert a 35 x 43 cm sheet of film into the NIP of the DETECTOR CROSSOVER ROLLERS.

[4] To adjust for squareness, use the film to align the FILM GUIDE with the DETECTOR CROSSOVER ROLLERS.

[5] Tighten the 4 SCREWS.

DETECTOR SWITCH

Adjustment



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Warning
Moving Parts

[1] Remove the TOP COVER.

[2] Check for squareness:

- DEVELOPER RACK, See Page 9
- DETECTOR CROSSOVER AY, See Page 7

[3] Install:

- DEVELOPER RACK
- DETECTOR CROSSOVER AY

[4] Loosen the 2 SCREWS on the DETECTOR SWITCHES.

[5] Move the 2 DETECTOR SWITCHES up to the top position.

[6] Set the distance between the MAGNET and the DETECTOR SWITCH on the drive side to 1.6 mm (0.06 in.):

(a) Loosen the SCREW.

(b) Move the ROCKER ARM.

(c) Tighten the SCREW.

Warning
Dangerous Voltage

[7] Energize the PROCESSOR.

[8] Lift the top DETECTOR ROLLER.

[9] Insert a 2.54 cm (1 in.) piece of film into the drive side of the DETECTOR ROLLER.

[10] Slowly move the DETECTOR SWITCH on the drive side down until the REPLENISHMENT PUMP actuates.

[11] Tighten the 2 SCREWS on the DETECTOR SWITCH.

[12] Check that the REPLENISHMENT PUMP stops in 3 seconds after you remove the film.

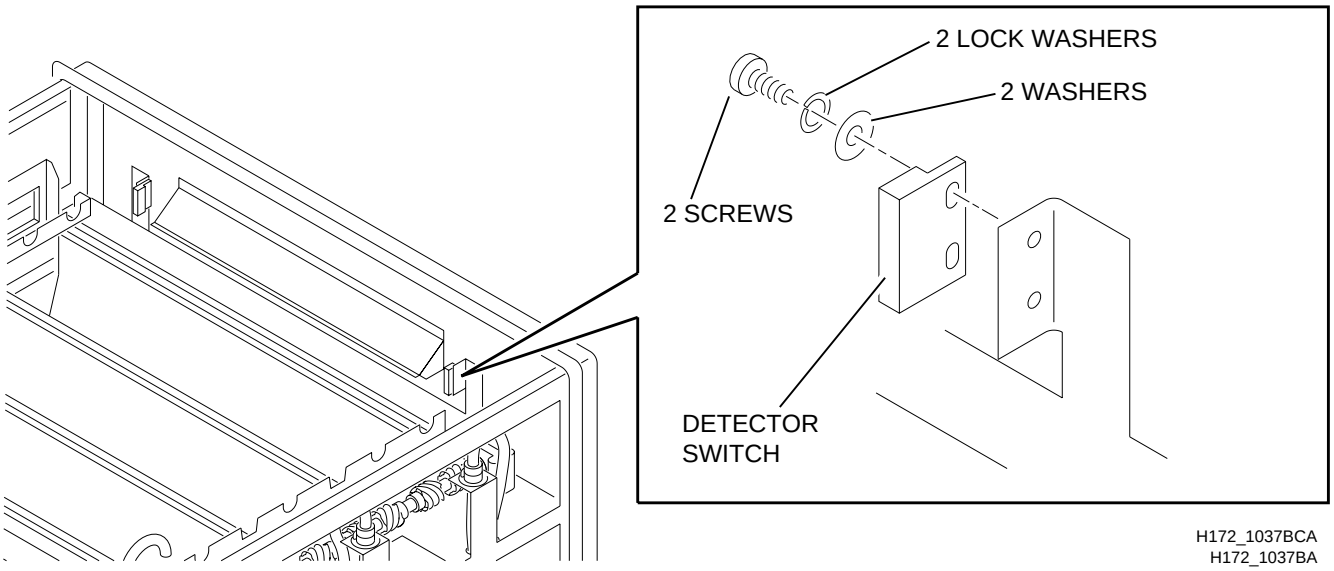
Note
The feed signal will emit a beep.

[13] Repeat Steps 8-12 for the DETECTOR SWITCH on the non-drive side.

[14] Install the TOP COVER.

[15] Check that the REPLENISHMENT PUMP does not operate unless you feed film.

Replacement



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Warning
Dangerous Voltage

[1] Disconnect the PROCESSOR from the main power.

[2] Remove:

- TOP COVER
- 2 SCREWS
- 2 LOCK WASHERS
- 2 WASHERS
- DETECTOR SWITCHES
- WIRE TIES, not visible in graphic

ESD
Possible damage from electrostatic discharge.

[3] Disconnect the SWITCH CABLE from the ELECTRICAL BOX.

[4] Connect the new SWITCH CABLE to the ELECTRICAL BOX.

[5] Install:

- DETECTOR SWITCHES
- 2 WASHERS
- 2 LOCK WASHERS
- 2 SCREWS
- new WIRE TIES
- TOP COVER

Warning
Dangerous Voltage

[6] Connect the PROCESSOR to the main power.

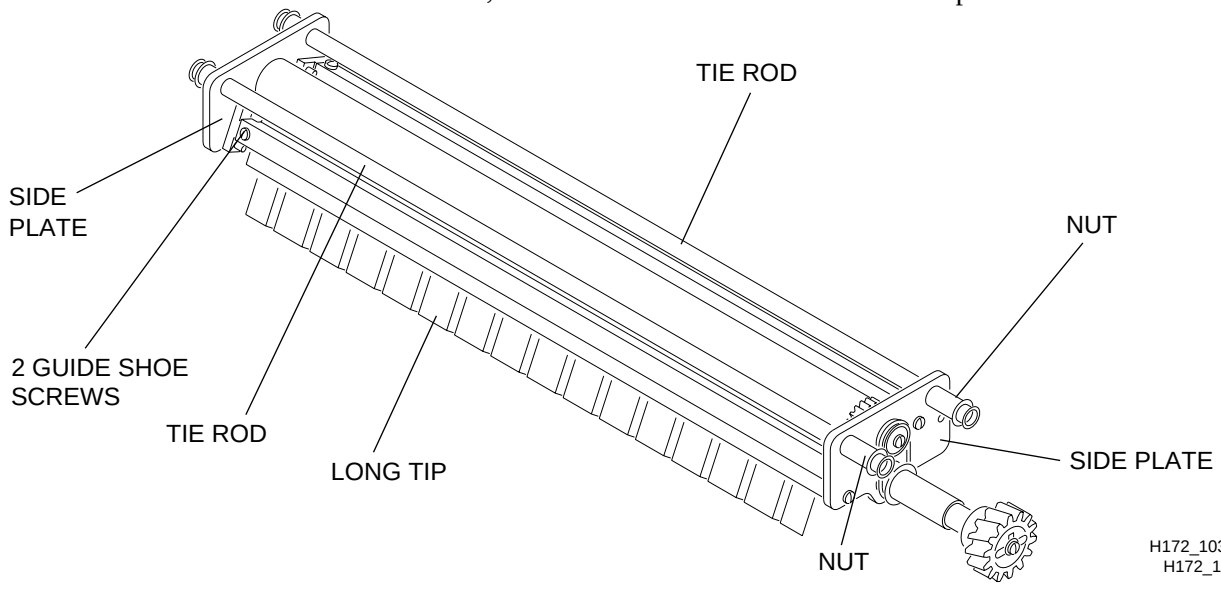
[7] Do the adjustment procedure for the DETECTOR SWITCHES. See Page 5.

CROSSOVER AY

Adjustment for Squareness

[1] Remove the CROSSOVER AY from the PROCESSOR.

[2] Place the CROSSOVER AY on a smooth, flat surface with the GUIDE SHOES up.

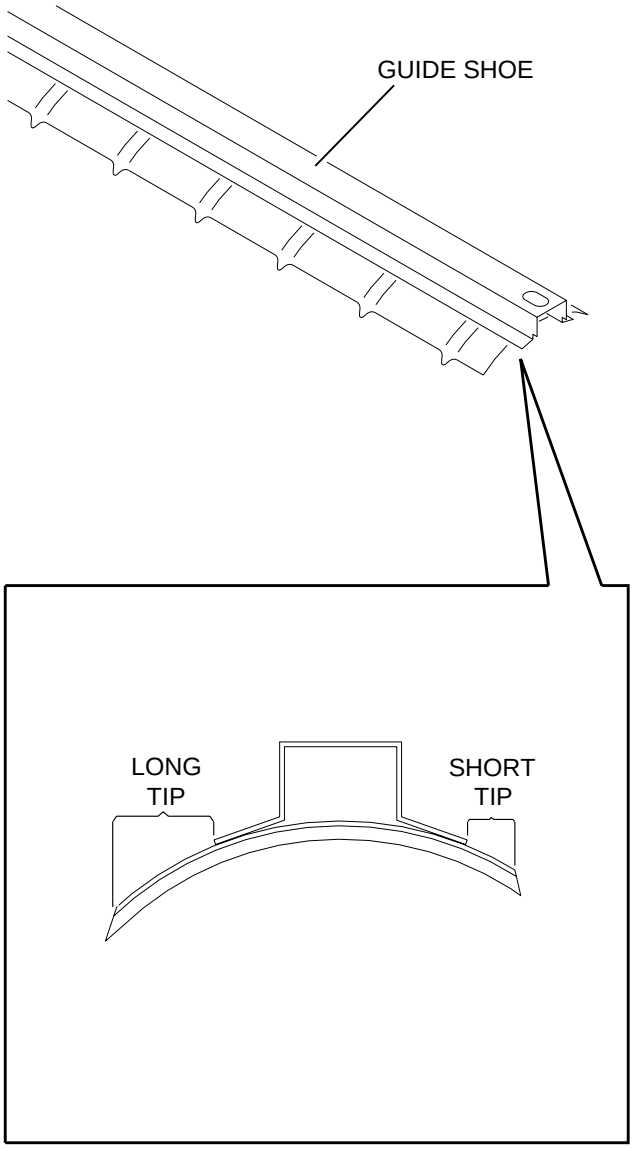


[3] Loosen the 4 NUTS on the TIE RODS.

[4] Press down on the SIDE PLATES so that the SIDE PLATES make uniform contact with the flat surface.

[5] Tighten the 4 NUTS.

Installing a new GUIDE SHOE



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[1] Remove:

- SCREWS
- GUIDE SHOE

[2] Install the new GUIDE SHOE with the LONG TIPS in the direction of film transport.

[3] Install the SCREWS.

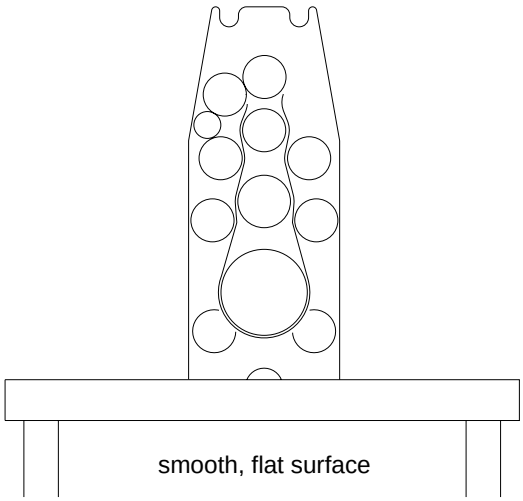
Note

There are no adjustment procedures for GUIDE SHOES.

RACK Adjustments

Adjustment for Squareness

Purpose: Use this procedure for the DEVELOPER, FIXER and WASH RACKS.
To adjust the squareness of a DRYER RACK, use the procedure on Page 14.



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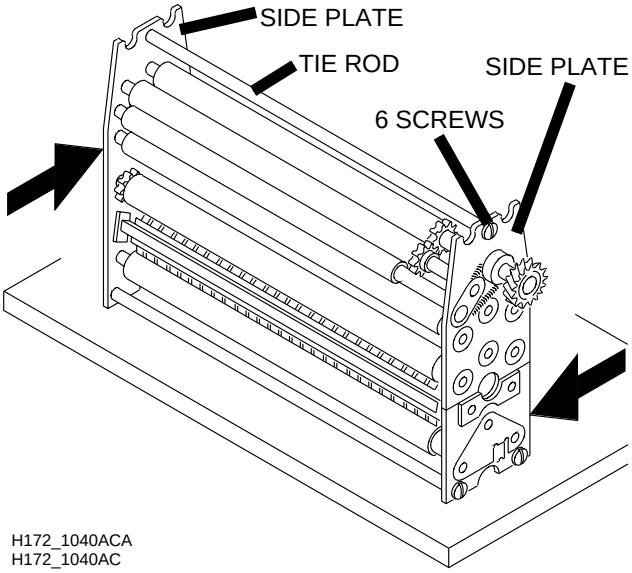
[1] Remove the RACK from the PROCESSOR.

[2] Place the RACK on a smooth, flat surface.



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H172_1040AC

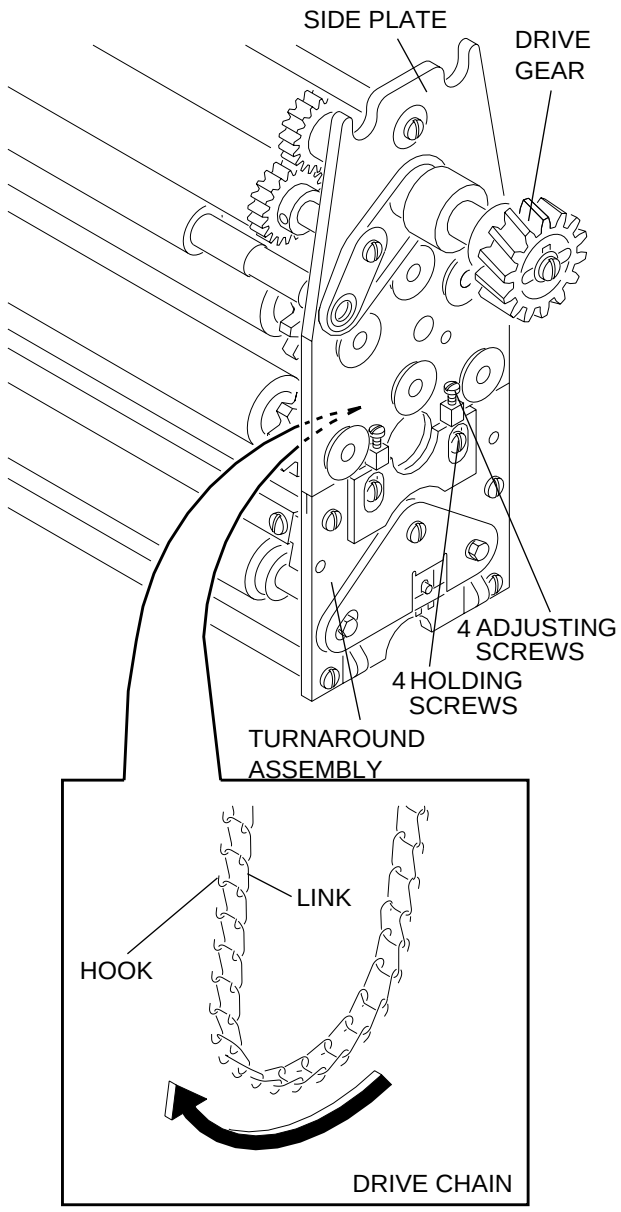
[3] Loosen the 6 SCREWS on the TIE RODS.

[4] Check that the SIDE PLATES are flat on the flat surface.

[5] If necessary, apply pressure to the SIDE PLATES. See the figure.

[6] Tighten the SCREWS.

Tension of the DRIVE CHAIN



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[1] Check that the CHAIN is wet with solution.

[2] Check that the RACK is approximately the same temperature as the solution.

Note

[3] Remove the RACK from the PROCESSOR.

[4] Place the RACK on a smooth, flat surface.

[5] Loosen the 4 HOLDING SCREWS.

[6] On the drive side, loosen the 2 ADJUSTING SCREWS until the SCREWS do not touch the SIDE PLATE of the TURNAROUND AY.

[7] Lift the RACK off of the surface and allow the weight of the TURNAROUND AY to tighten the CHAIN.

[8] Manually rotate the DRIVE GEAR one full rotation.

[9] Tighten the 2 HOLDING SCREWS on the DRIVE side.

[10] Tighten the 2 ADJUSTING SCREWS on the DRIVE side until the SCREWS touch the SIDE PLATE of the TURNAROUND AY.

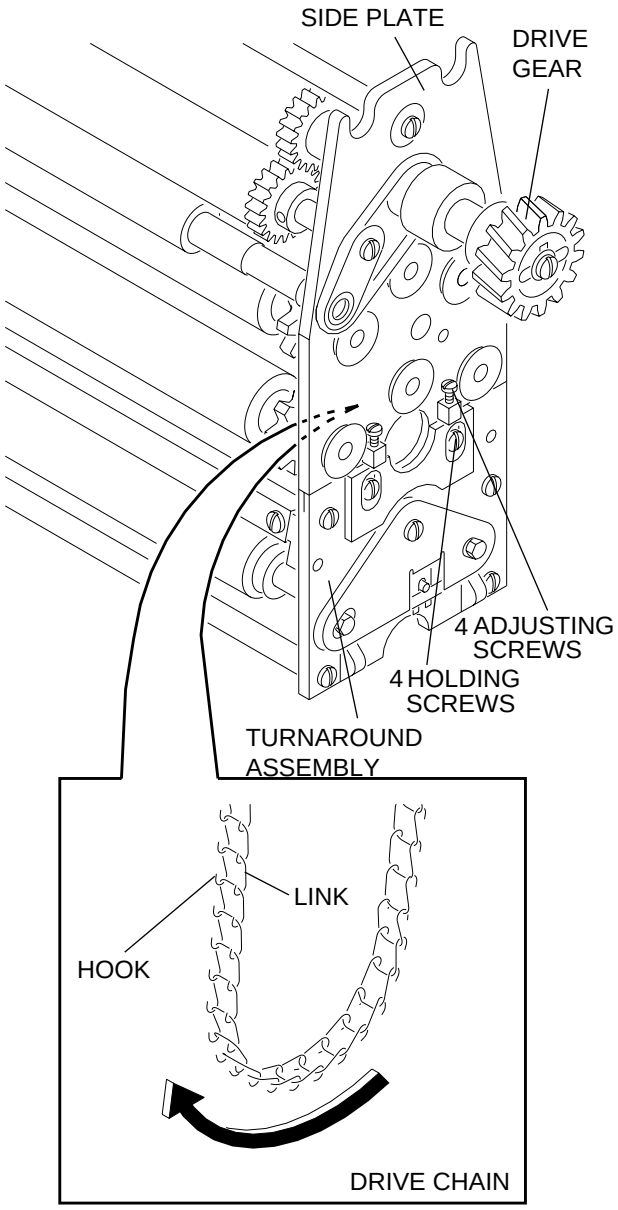
[11] Observe the distance between the RACK SIDE PLATE and TURNAROUND SIDE PLATE on the DRIVE side.

[12] Rotate the 2 ADJUSTING SCREWS on the NON-DRIVE side until the distance between the SIDE PLATES is the same as the DRIVE side.

[13] Tighten the 2 HOLDING SCREWS on the NON-DRIVE side.

RACK Replacements

DRIVE CHAIN



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[1] Use a SCREWDRIVER to pry open the HOOKS of a LINK.

[2] Connect the new DRIVE CHAIN to the old DRIVE CHAIN. Make sure the HOOKS and the openings of the LINKS are in the correct direction.

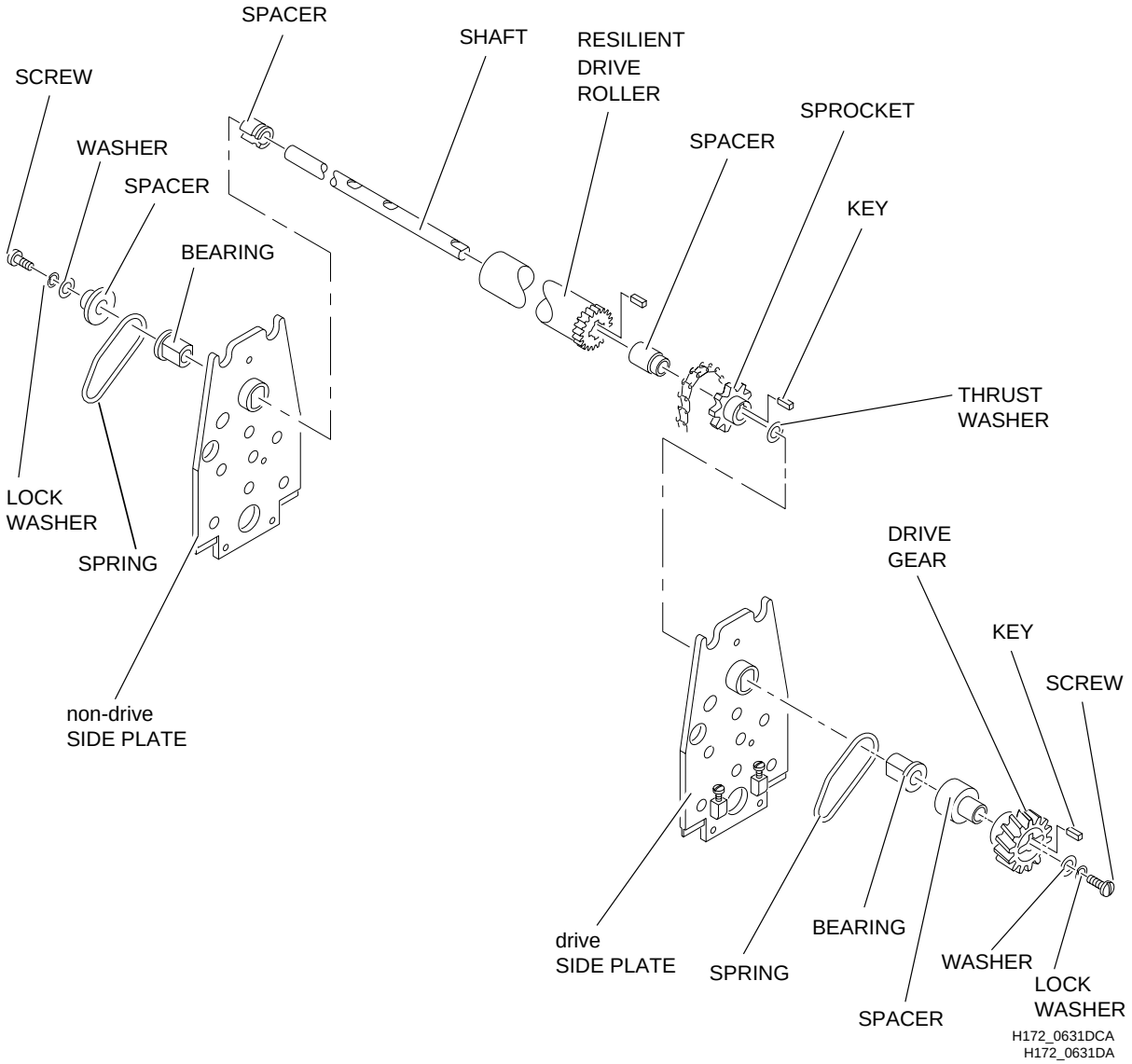
[3] Pull the old DRIVE CHAIN through the RACK AY until the new DRIVE CHAIN is in the correct position.

[4] Remove the old DRIVE CHAIN.

[5] Connect the ends of the new DRIVE CHAIN.

[6] Use the procedure on Page 10 to adjust the tension of the DRIVE CHAIN.

RESILIENT DRIVE ROLLER in the DEVELOPER and FIXER RACKS



[1] Remove the 2 SPRINGS from the top of the RACK.

[2] Remove from the ends of RESILIENT DRIVE ROLLER outside of the SIDE PLATES:

- SCREWS
- WASHERS
- LOCK WASHERS
- GEAR
- SPACERS
- BEARINGS

[3] Rotate the flat part of the SHAFT to the up position.

[4] Move the DRIVE ROLLER toward the non-drive side and remove the KEY from the DRIVE GEAR.

[5] Move the SHAFT of the DRIVE ROLLER towards the drive side.

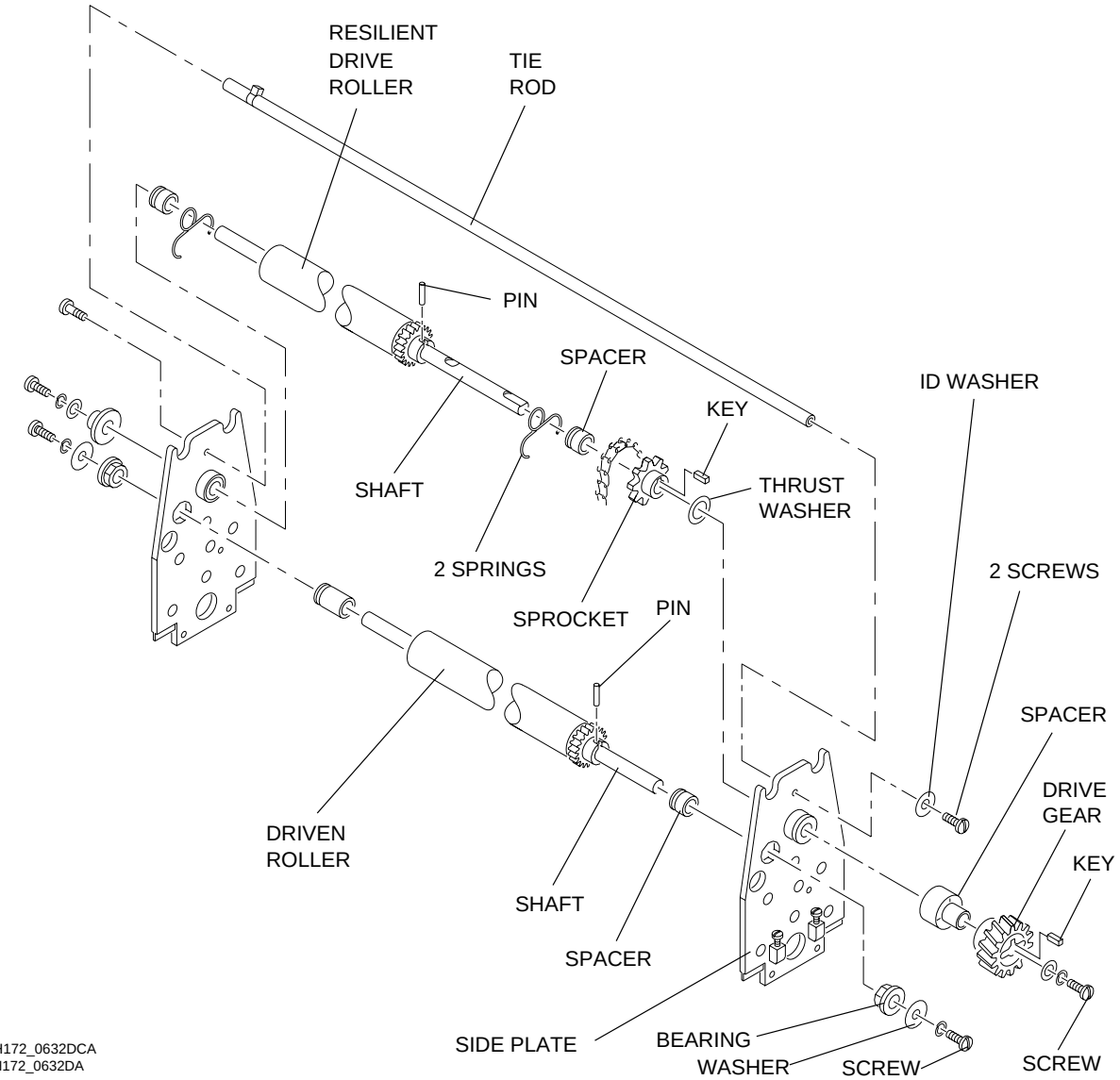
[6] Remove:

- THRUST WASHER
- SPROCKET
- SPACER

[7] Remove the DRIVE ROLLER.

[8] Reverse the steps to install a new DRIVE ROLLER.

RESILIENT DRIVE ROLLERS in the WASH RACK



[1] Remove from the TIE ROD:

- 2 SCREWS
- ID WASHER

[2] Remove from the ends of DRIVE ROLLER and DRIVEN ROLLER outside of the SIDE PLATES:

- SCREWS
- WASHERS
- DRIVE GEAR
- SPACERS
- BEARINGS

[3] Rotate the flat part of the SHAFT to the up position.

[4] Remove the 2 SPRINGS.

[5] Move the 2 SHAFTS of the DRIVE ROLLER and the DRIVEN ROLLER towards the non-drive SIDE PLATE.

[6] Bend the SIDE PLATE a small distance and remove the ends of the 2 SHAFTS.

[7] Remove:

- THRUST WASHER
- SPROCKET
- SPACER

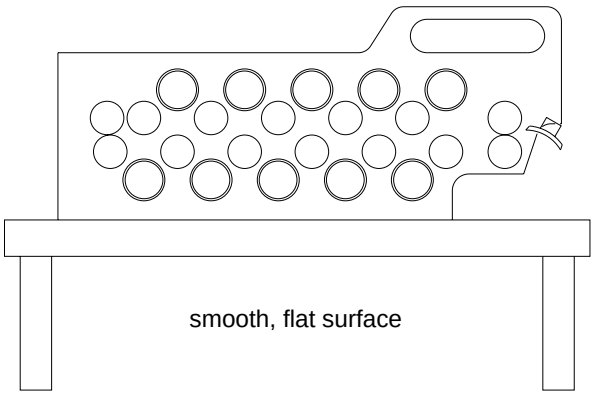
[8] Reverse the steps to install a new DRIVE ROLLER and DRIVEN ROLLER.

DRYER RACK

Adjustment for Squareness

[1] Remove the RACK from the PROCESSOR.

[2] Place the CROSSOVER AY on a smooth, flat surface.



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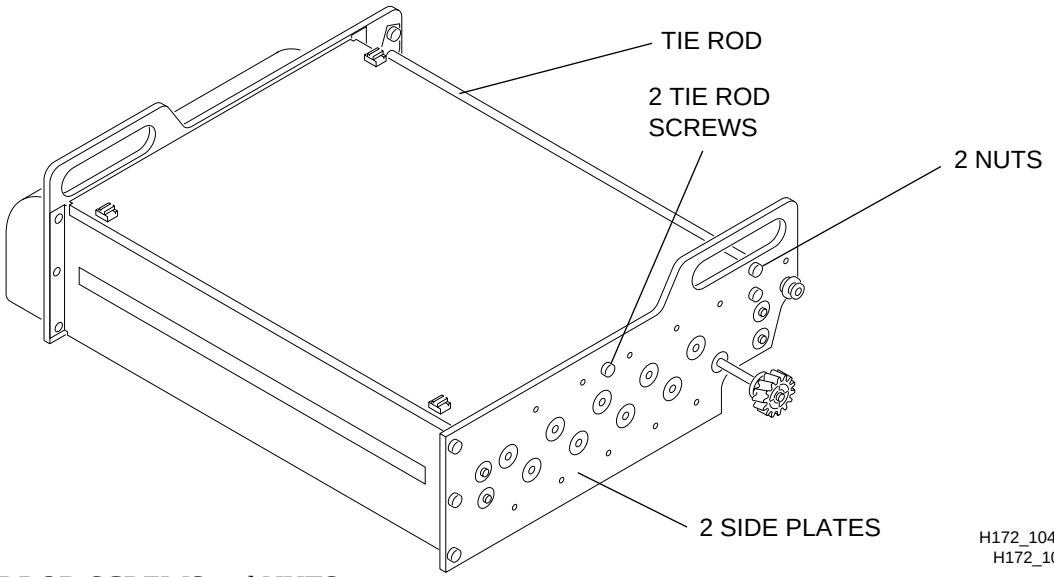

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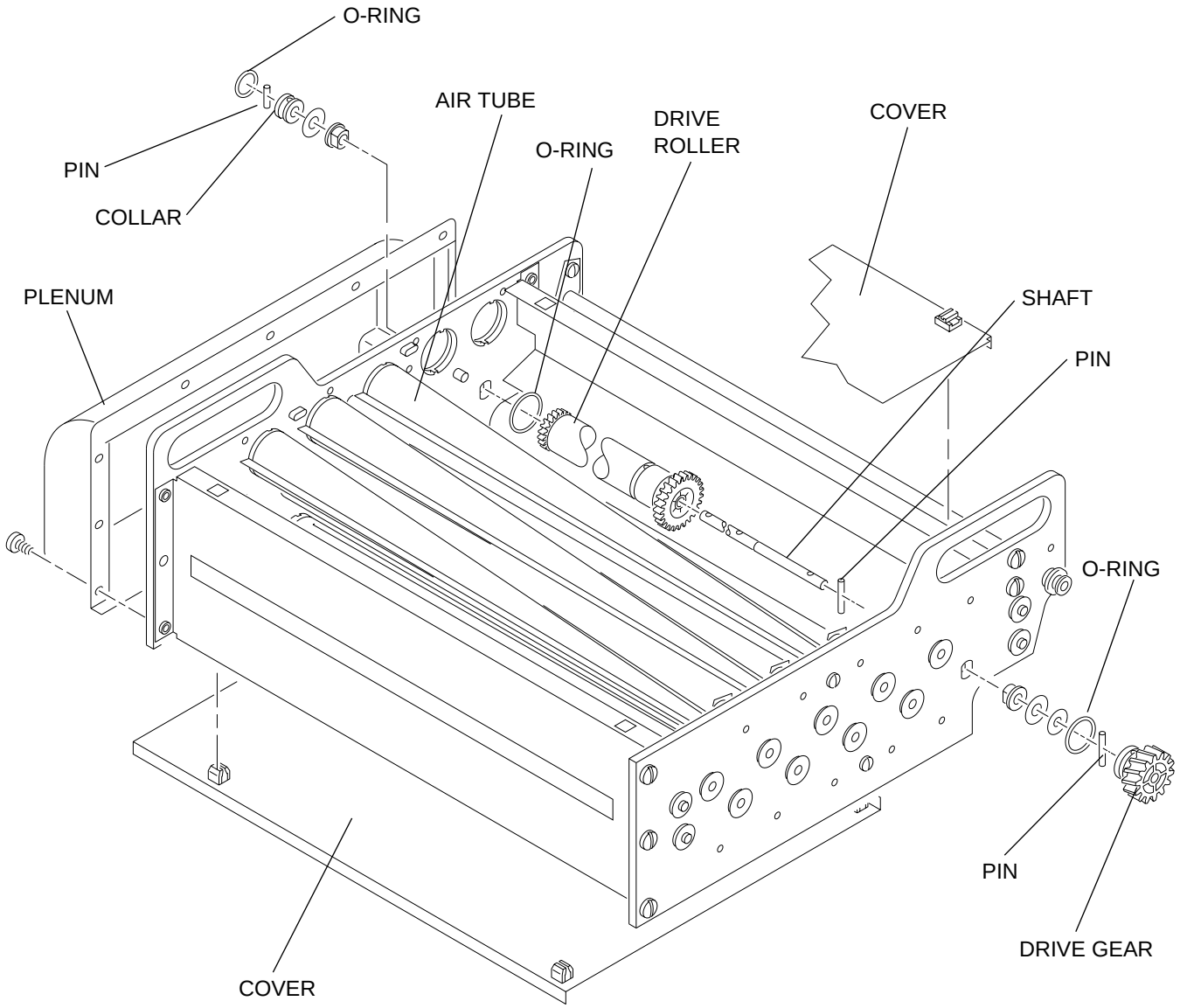
[3] Loosen the TIE ROD SCREWS and NUTS.

[4] Press down on the SIDE PLATES so that the SIDE PLATES make uniform contact with the flat surface.

[5] Tighten the TIE ROD SCREWS and NUTS.

Installing a new DRIVE ROLLER



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H172_1044DA

[1] Remove the DRYER RACK from the PROCESSOR.

[2] Remove:

- top and bottom COVERS
- PLENUM
- first 3 AIR TUBES
- O-RING from the DRIVE GEAR
- PIN
- DRIVE GEAR

[3] From the NON-DRIVE side, remove:

- O-RING from the COLLAR
- PIN
- COLLAR

[4] Remove the O-RING from the DRIVE COLLAR on the drive side.

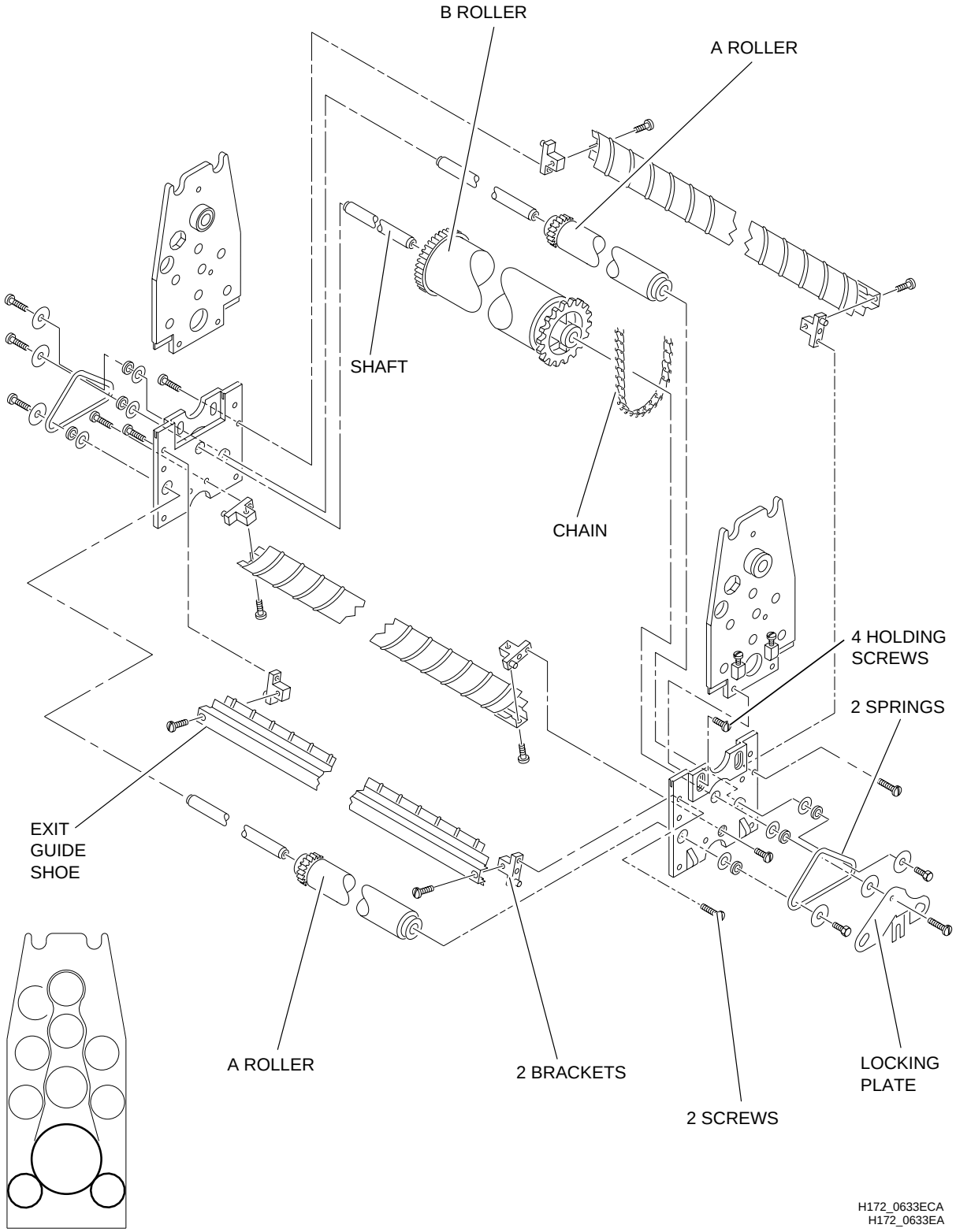
[5] Remove from the DRIVE ROLLER:

- PIN
- SHAFT

[6] Reverse the steps to install a new DRIVE ROLLER.

TURNAROUND AY

Disassembling the TURNAROUND AY



[1] Remove:

- EXIT GUIDE SHOE and 2 BRACKETS
- ROLLER above the GUIDE SHOE
- 2 SPRINGS and LOCKING PLATE
- 2 A ROLLERS

[2] Pull the SHAFT from the B ROLLER from the non-drive side.

[3] Remove:

- 4 HOLDING SCREWS
- CHAIN from the B ROLLER
- TURNAROUND AY

Installing a new B ROLLER

See the Figure on Page 17.

[1] Remove:

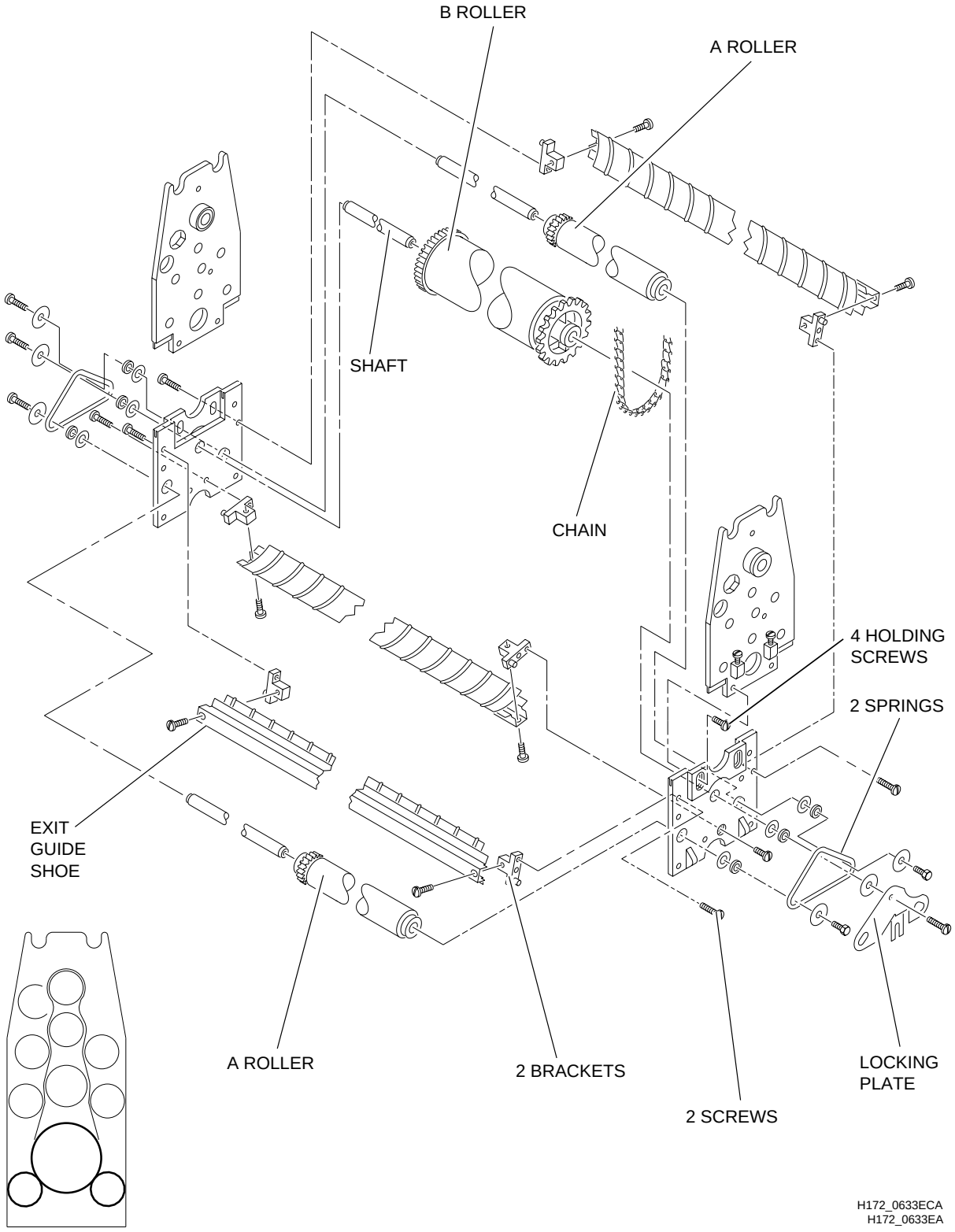
- TURNOVER AY from the RACK
- 2 SPRINGS
- LOCKING PLATE
- 2 A ROLLERS
- 2 SCREWS
- 2 BRACKETS
- EXIT GUIDE SHOE
- SHAFT, THRUST WASHERS and the BEARING from the B ROLLER

[2] Install:

- new B ROLLER, THRUST WASHERS and the BEARING on the SHAFT
- EXIT GUIDE SHOE
- 2 BRACKETS
- 2 SCREWS
- 2 A ROLLERS
- LOCKING PLATE
- 2 SPRINGS
- TURNOVER AY in the RACK

[3] Use the procedure on Page 10 to adjust the tension on the DRIVE CHAIN, if necessary.

Installing new A ROLLERS



[1] Remove:

- 2 SPRINGS
- LOCKING PLATE
- SCREW
- A ROLLER from the SHAFT

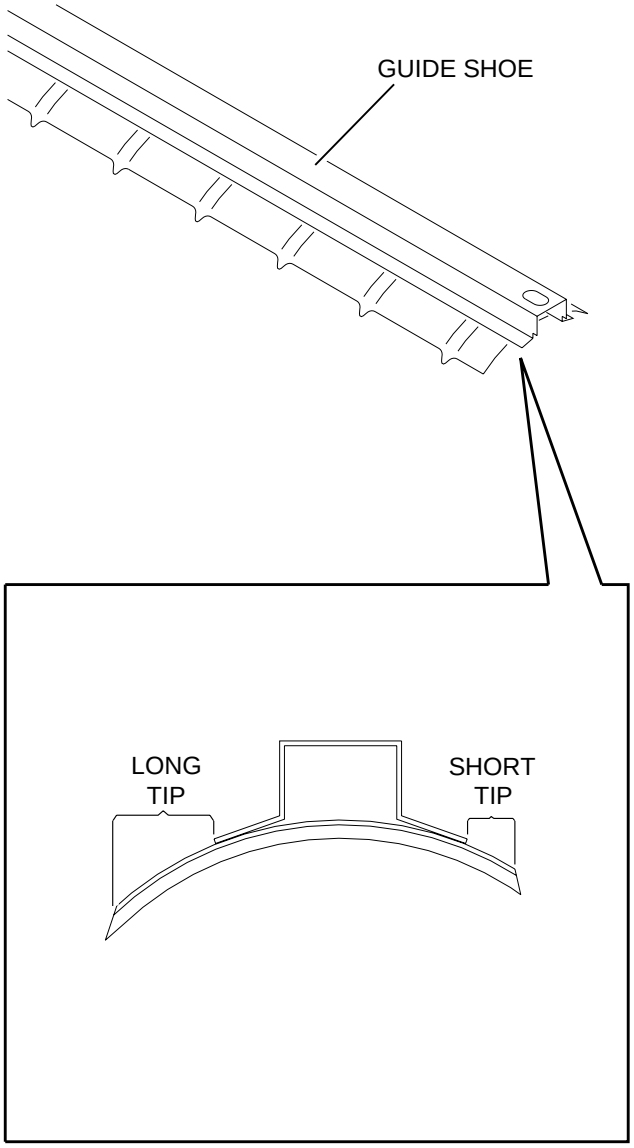
[2] Install:

- new A ROLLER on the SHAFT
- A ROLLER in the TURNAROUND AY
- LOCKING PLATE
- SCREW
- 2 SPRINGS

[3] Check that all the GEARS in the TURNAROUND AY engage.

Checking the GUIDE SHOES

[1] Check that the LONG TIPS are in the direction of film transport.



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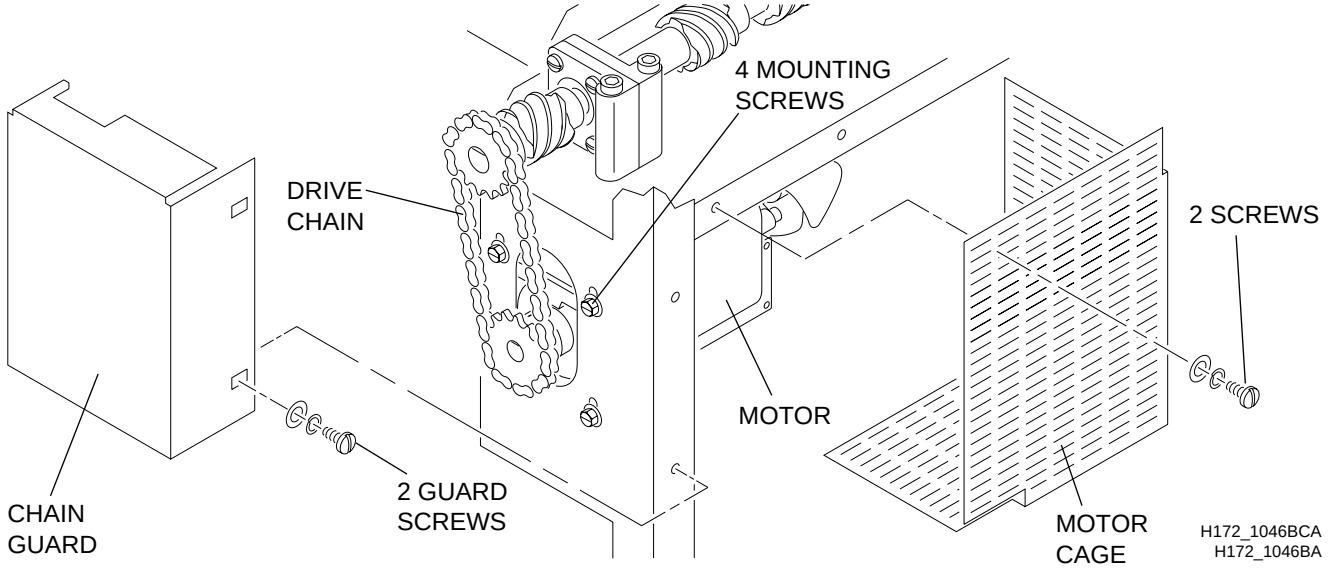
MAIN DRIVE

Adjusting the MAIN DRIVE CHAIN



Warning

- Dangerous Voltage
- Moving Parts

[1] Disconnect the PROCESSOR from the main power.

[2] Remove:

- DRIVE SIDE PANEL
- 2 GUARD SCREWS
- CHAIN GUARD
- 2 SCREWS
- MOTOR CAGE

[3] Loosen the 4 MOUNTING SCREWS.

Caution

Do not tighten the DRIVE CHAIN excessively.

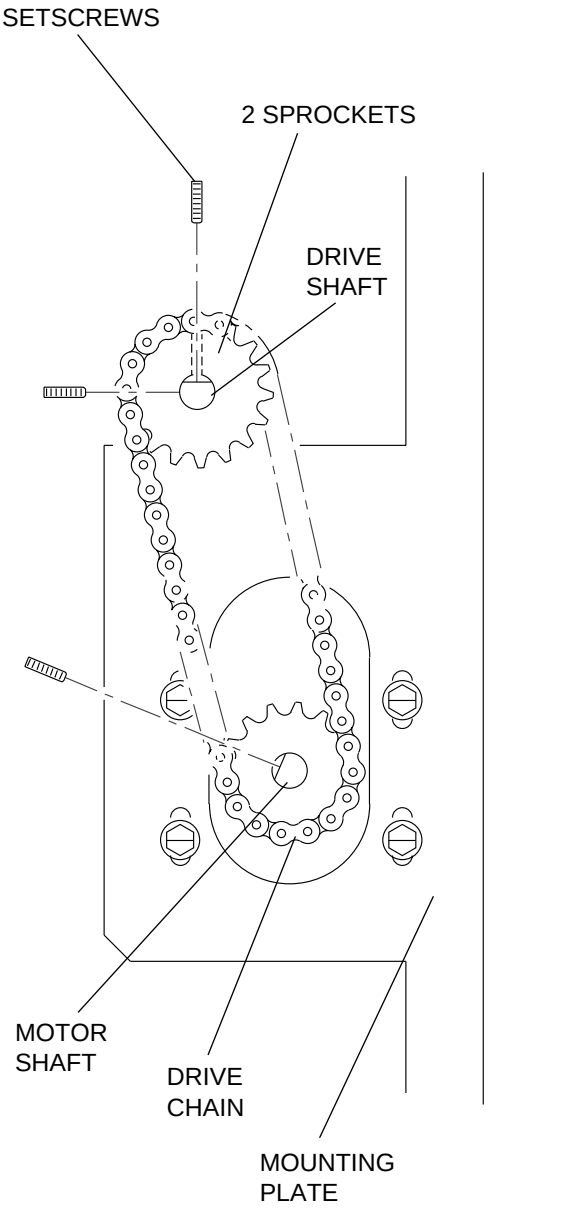
[4] Move the DRIVE MOTOR to tighten the DRIVE CHAIN.

[5] Tighten the 4 MOUNTING SCREWS.

[6] Install:

- MOTOR CAGE
- 2 SCREWS
- CHAIN GUARD
- 2 GUARD SCREWS
- DRIVE SIDE PANEL

Aligning the MAIN DRIVE MOTOR



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Warning

- Dangerous Voltage
- Moving Parts

[1] Disconnect the PROCESSOR from the main power.

[2] Remove:

- DRIVE SIDE PANEL
- 2 GUARD SCREWS
- CHAIN GUARD

[3] Loosen the 3 SETSCREWS.

[4] Align the SPROCKETS with eachother.

[5] Tighten the 3 SETSCREWS.

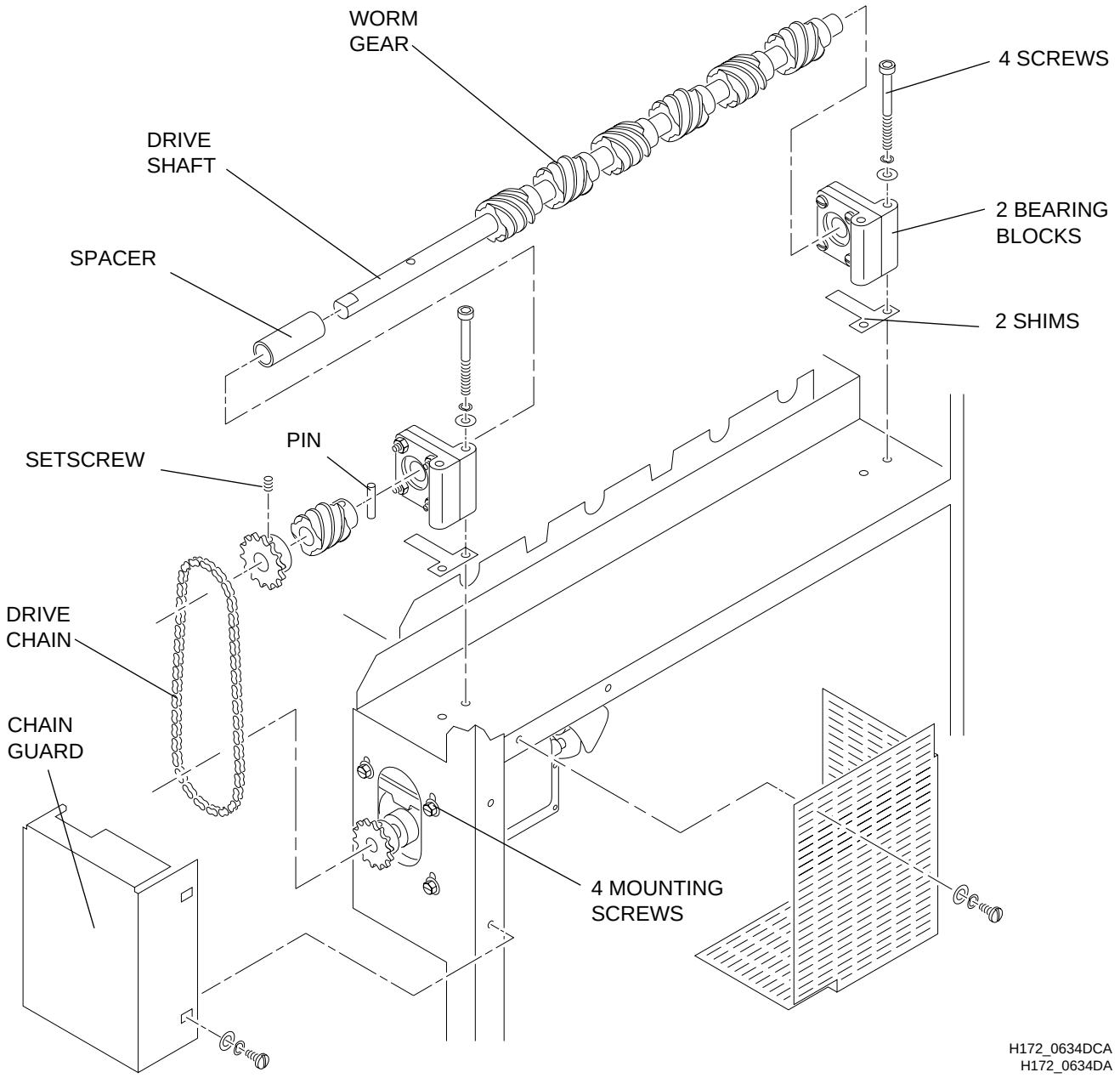
[6] Check:

- DRIVE CHAIN does not touch the MOUNTING PLATE
- SPROCKET on the DRIVE SHAFT does not touch the DRYER RACK

[7] Install:

- DRIVE SIDE PANEL
- 2 GUARD SCREWS
- CHAIN GUARD

Installing a new MAIN DRIVE SHAFT, WORM GEARS or BEARING BLOCKS



[1] Remove the CHAIN GUARD.

[2] Loosen the 4 MOUNTING SCREWS.

[3] Remove:

- DRIVE CHAIN
- 4 SCREWS from the 2 BEARING BLOCKS
- SHIMS
- DRIVE SHAFT

[4] Install the new WORM GEAR or BEARING BLOCKS.

[5] Place the SHIMS under the BEARING BLOCKS.

[6] Install, but do not tighten, the 4 SCREWS in the BEARING BLOCKS.

[7] Adjust the position of the BEARING BLOCKS until the DRIVE SHAFT moves freely.

Caution

Do not tighten the SCREWS excessively.

[8] Tighten the 4 SCREWS.

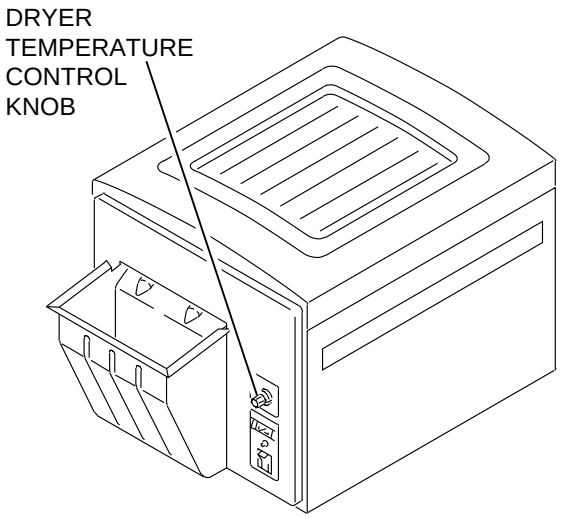
[9] Use the procedure on Page 21 to adjust the tension of the MAIN DRIVE CHAIN.

[10] Tighten the 4 MOUNTING SCREWS.

[11] Install the CHAIN GUARD.

DRYER HEATER

Adjusting the Temperature



H172_1065ACA
H172_1065AC

Important

Factors which determine the correct temperature are:

- condition of the air
- amount and type of the film

Use the lowest temperature necessary to dry the film.

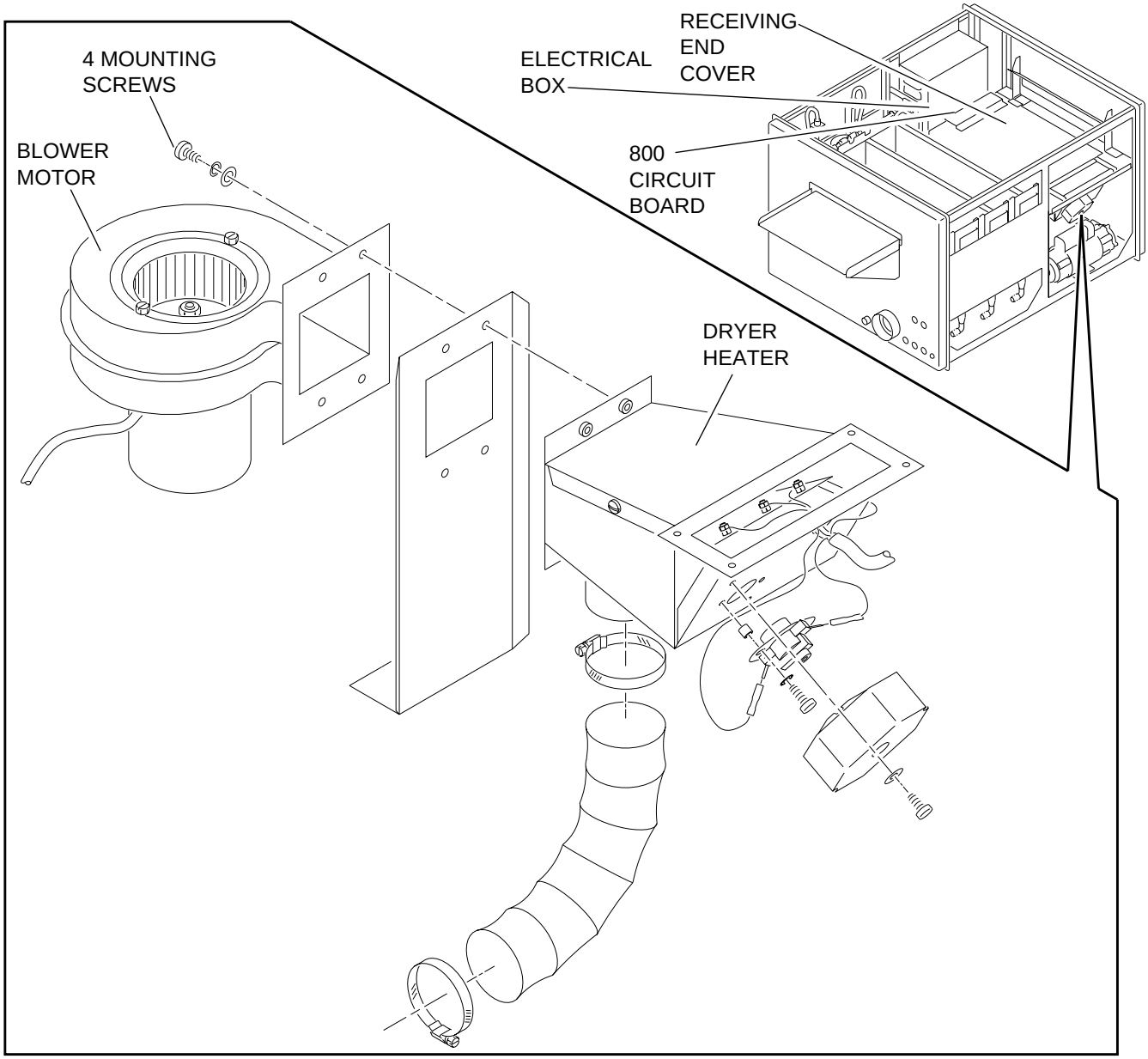
[1] Rotate the DRYER TEMPERATURE CONTROL KNOB to adjust the temperature:

- clockwise to increase the temperature
- counterclockwise to decrease the temperature

Installing a new BLOWER AY

Warning
Dangerous Voltage

[1] Disconnect the main power.



H172_1048DCA
H172_1048DA

[2] Remove:

- TOP COVER
- DRYER RACK
- RECEIVING END COVER
- SIDE PANELS

ESD
Possible damage from electrostatic discharge.

[3] Disconnect from the 800 CIRCUIT BOARD:
(Not visible in the graphic)

- CONNECTOR 801
- CONNECTOR 802

[4] Disconnect the CABLE ASSEMBLY from the ELECTRICAL BOX.

[5] Remove:

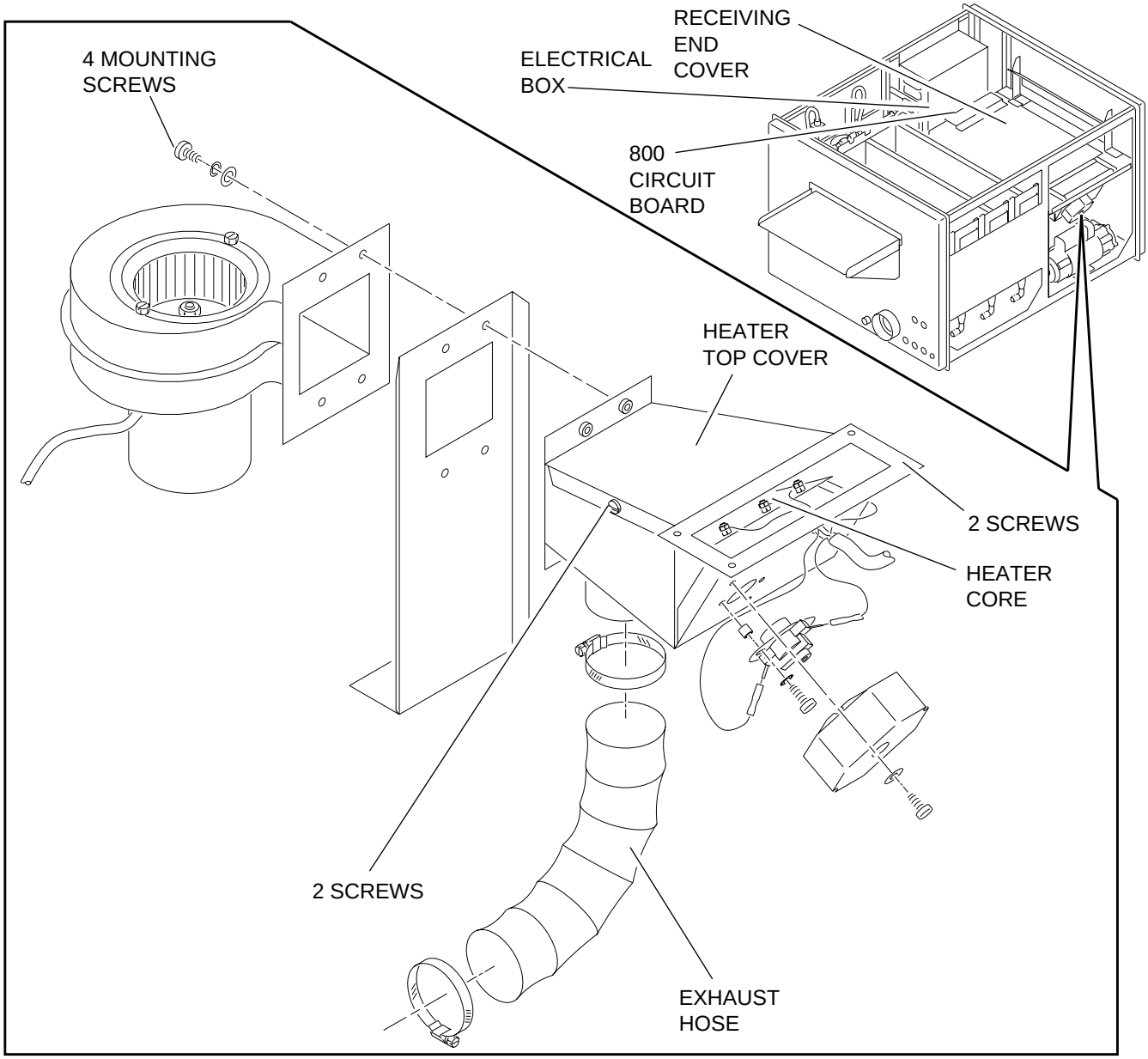
- MOUNTING SCREWS
- BLOWER MOTOR

[6] Reverse the steps to install the new BLOWER MOTOR.

Installing a new DRYER HEATER or HEATER CORE

Warning
Dangerous Voltage

[1] Disconnect the main power.



H172_1048DCB
H172_1048DA

[2] Remove:

- TOP COVER
- DRYER RACK
- RECEIVING END COVER
- SIDE PANELS

ESD
Possible damage from electrostatic discharge.

[3] Disconnect from the 800 CIRCUIT BOARD:
(Not visible in the graphic)

- CONNECTOR 801
- CONNECTOR 802

[4] Disconnect from the ELECTRICAL BOX:

- TB2-1
- TB2-3
- TB2-5
- GROUND WIRE

[5] Remove:

- EXHAUST HOSE
- 6 MOUNTING SCREWS
- 4 SCREWS
- DRYER HEATER

[6] To install a new DRYER HEATER, reverse the steps above.
To install a new HEATER CORE, continue with Step 7.

[7] Loosen the 2 SCREWS.

[8] Remove the HEATER TOP COVER.

[9] Remove from inside the DRYER HEATER:
(Not visible in the graphic)

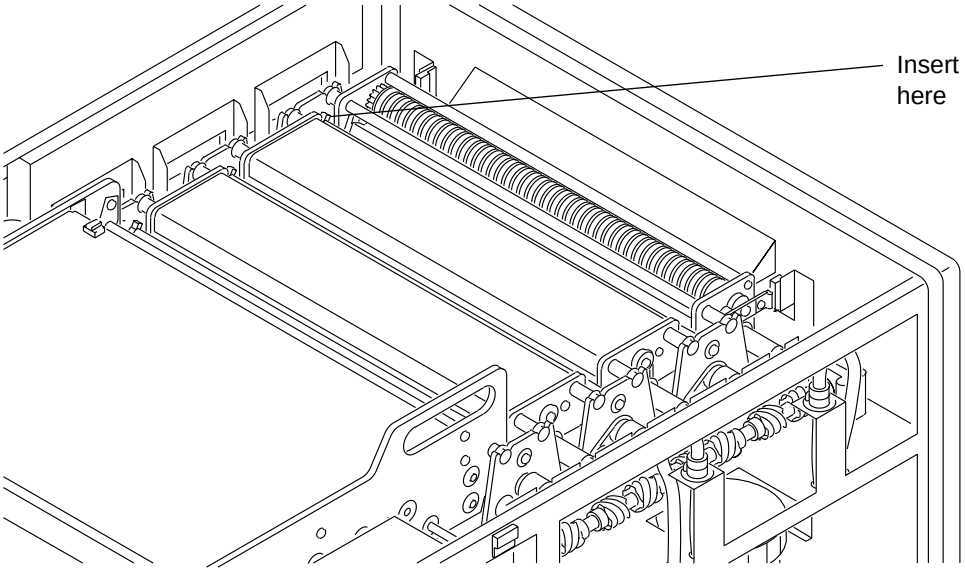
- 4 HEX NUTS
- 4 MOUNTING SCREWS
- HEATER CORE

[10] Reverse the steps to install the new HEATER CORE.

PLUMBING System Adjustments

Adjusting the Developer Temperature

[1] Remove the TOP COVER.



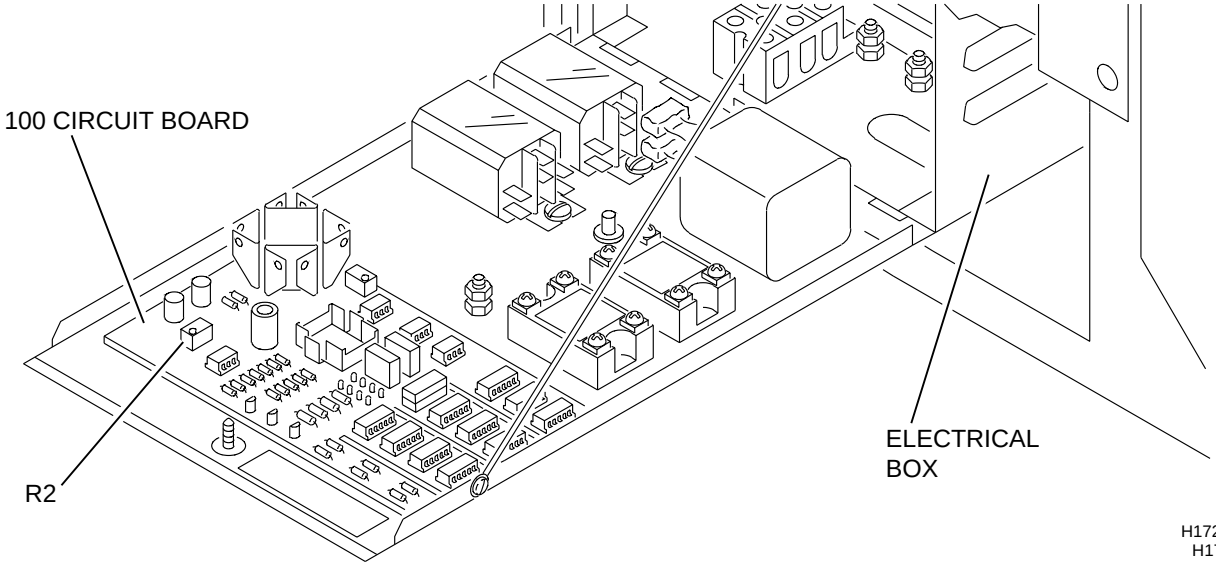
H172_1006BCB
H172_1006BC

[2] Wait until the TEMPERATURE READY LIGHT blinks slowly or does not illuminate.

[3] Insert a THERMOMETER into the DEVELOPER TANK on the non-drive side of the PROCESSOR between the SIDE PLATE of the DEVELOPER RACK and the RACK SUPPORT.

[4] Check that the temperature of the developer is correct for the operating cycle of the PROCESSOR.

Cycle	Temperature
Standard	33.3 ± 0.3°C (92.0 ± 0.5°F)
Rapid	34.4 ± 0.3°C (94.0 ± 0.5°F)



H172_1031BCB
H172_1031BC

[5] If the developer temperature is correct, advance to Step 9.

Warning

- Dangerous Voltage
- Possible damage from electrostatic discharge

[6] If the developer temperature is not correct:

(a) Remove the DRIVE SIDE PANEL.

(b) Open the DOOR on the ELECTRICAL BOX.

(c) Use the POTENTIOMETER ADJUSTING TOOL TL-1481 to adjust R2 on the 100 CIRCUIT BOARD:

- Rotate R2 clockwise to increase the temperature
- Rotate R2 counterclockwise to decrease the temperature

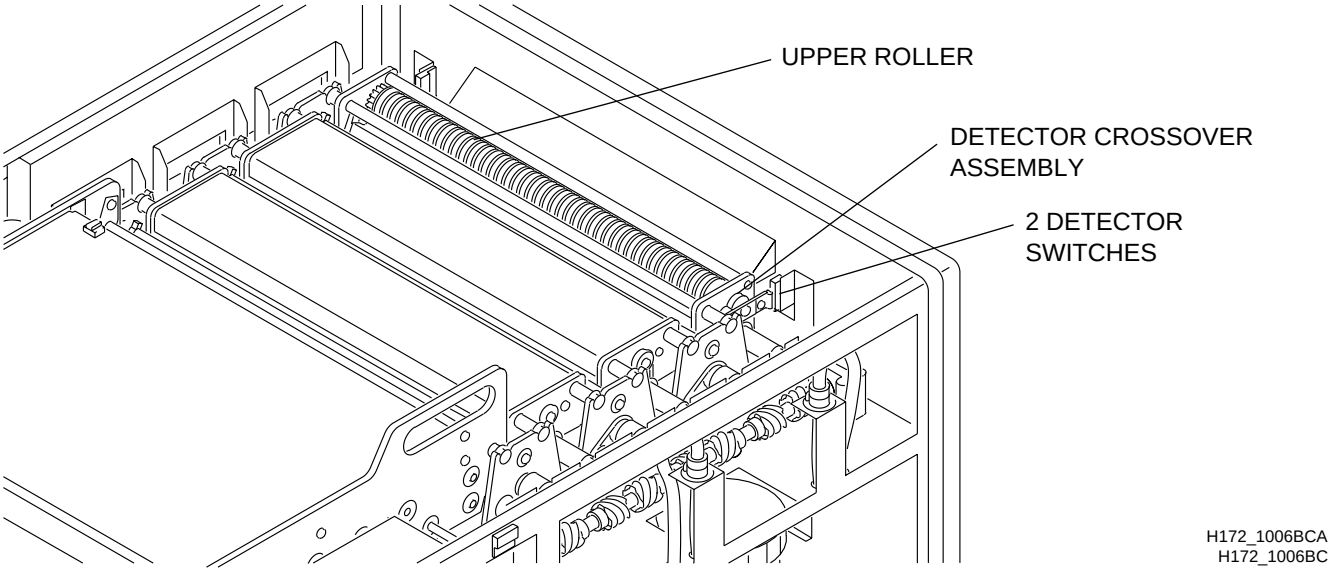
[7] Allow the developer solution to reach a stable temperature.

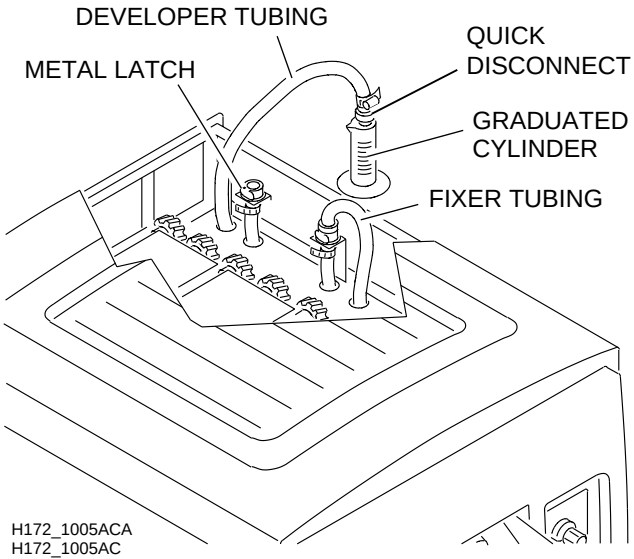
[8] Do Step 4.

[9] Close the DOOR on the ELECTRICAL BOX.

[10] Install the DRIVE SIDE PANEL and TOP COVER.

Checking the Replenishment Rates





Warning

Wear protective eyewear. The replenishment solutions are pumped quickly and might splash.

[1] Remove the TOP COVER.

[2] Lift the UPPER ROLLER of the DETECTOR CROSSOVER AY.

[3] Check that the replenishment solutions flow freely through the TUBING located along the DRIVE SIDE RACKS.

[4] Disconnect the DEVELOPER TUBING by pressing the METAL LATCH.

Note

The DEVELOPER TUBING might be identified with a red WIRE TIE.

[5] Pull the DEVELOPER TUBING slightly and rotate it over the edge of the FRAME and into a GRADUATED CYLINDER.

[6] Lift the UPPER ROLLER of the DETECTOR CROSSOVER AY for the correct time:

Cycle	Time
Standard	34 seconds
Rapid	25 seconds

[7] When the REPLENISHMENT PUMP stops, check that the amount of solution in the GRADUATED CYLINDER is correct for the film size and use condition. See the table on Page 32.

[8] If the replenishment rate is not correct, do the procedure “Adjusting the REPLENISHMENT PUMP” on Page 32.

[9] Connect the DEVELOPER TUBING by pushing it into the METAL LATCH until the DEVELOPER TUBING snaps in place.

[10] Check the replenishment flow rate of the fixer solution by doing Steps 4 - 9 with the FIXER TUBING.

[11] Install the TOP COVER.

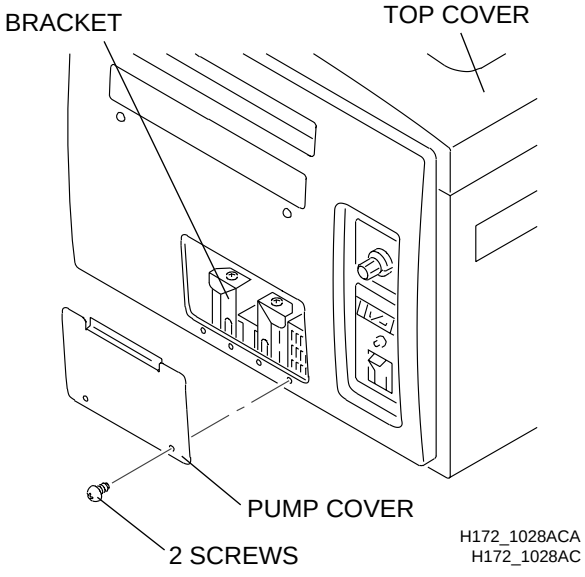
Film Size Processed	Use Condition	Average Amount of Film per 8 Hours of PROCESSOR Operation	Replenishment Flow Rate, mL per 35 x 43 cm 34 seconds for Standard Cycle 25 seconds for Rapid Cycle	
			Developer	Fixer
Only roll films 35 cm wide	High	105 Linear feet or more	50	70
	Medium	35 - 105 linear feet	65	85
	Low	35 linear feet or less*	80	100
Only 35 x 35 cm film	High	90 sheets or more	50	70
	Medium	30 - 90 sheets	65	85
	Low	30 sheets or less*	80	100
Average size intermix film	High	115 sheets or more	50	70
	Medium	40 - 115 sheets	65	85
	Low	40 sheets or less*	80	100
Only 35 x 43 cm film	High	75 sheets or more	60	85
	Medium	25 - 75 sheets	80	100
	Low	25 sheets or less*	100	120

* If sensitometry does not stay within control limits, flooded replenishment may be needed. Order and install FLOODED REPLENISHMENT KIT 419779.

Note

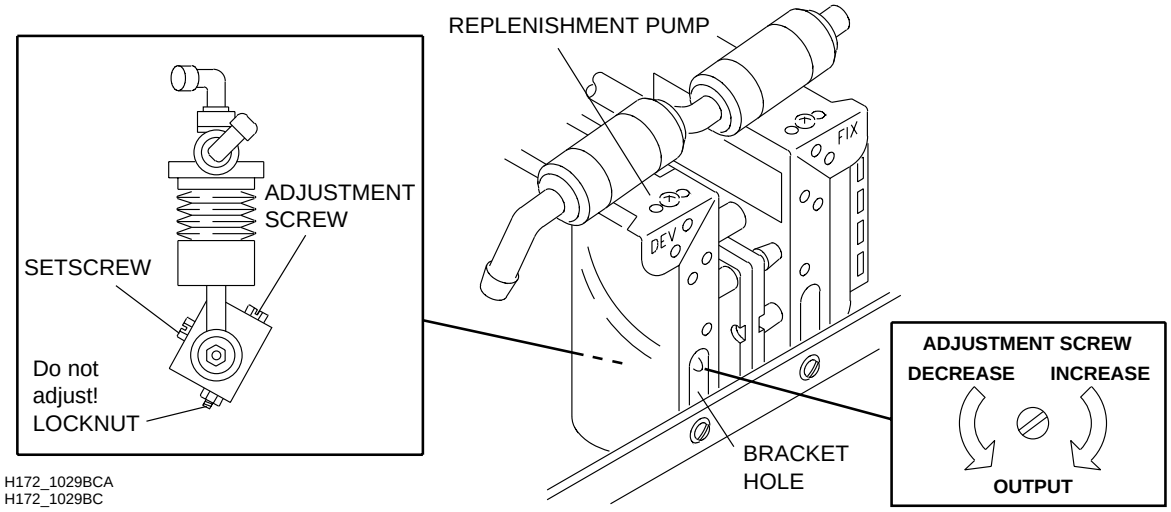
For more information and for new recommended processing instructions, see SERVICE BULLETIN 30, Pub. No. 632661.

Adjusting the REPLENISHMENT PUMP



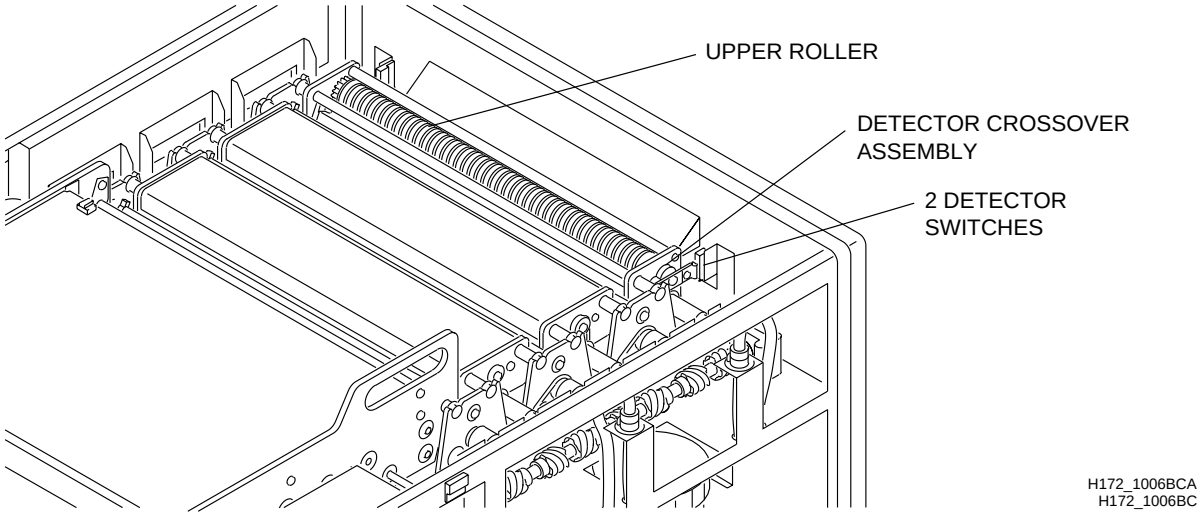
[1] Remove:

- TOP COVER
- RECEIVING BIN
- 2 SCREWS
- PUMP COVER



[2] Check to see if the ADJUSTMENT SCREW is visible through the BRACKET HOLE.

[3] If the ADJUSTMENT SCREW is visible, advance to Step 5.



[4] If the ADJUSTMENT SCREW is not visible, operate the REPLENISHMENT PUMP until the ADJUSTMENT SCREW is visible by lifting the UPPER ROLLER of the DETECTOR CROSSOVER AY.

Caution

Do not adjust the LOCKNUT.

[5] Loosen the SETSCREW.

[6] Rotate the ADJUSTMENT SCREW to change the flow rate:

- clockwise to increase the flow rate.
- counterclockwise to decrease the flow rate.

[7] Tighten the SETSCREW.

[8] Check the Replenishment Rates. See Page 31

[9] If the flow rate is not correct, do Steps 3 - 8 again

[10] Install:

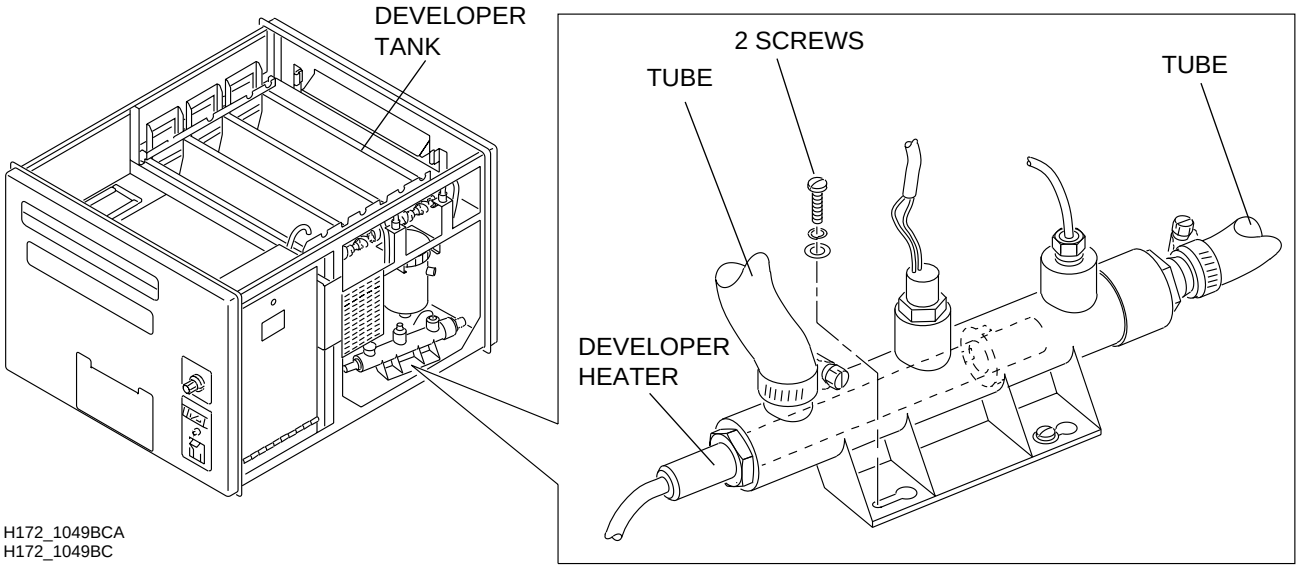
- PUMP COVER
- 2 SCREWS
- TOP COVER
- RECEIVING BIN

PLUMBING System Replacements

DEVELOPER HEATER

Warning
Dangerous Voltage

[1] Disconnect the main power.



[2] Drain the DEVELOPER TANK or apply CLAMPS to the 2 TUBES on the THERMOWELL.

ESD
Possible damage from electrostatic discharge.

[3] Open the ELECTRICAL BOX.

[4] Disconnect the wires of the DEVELOPER HEATER at TB2-9 and TB2-10.

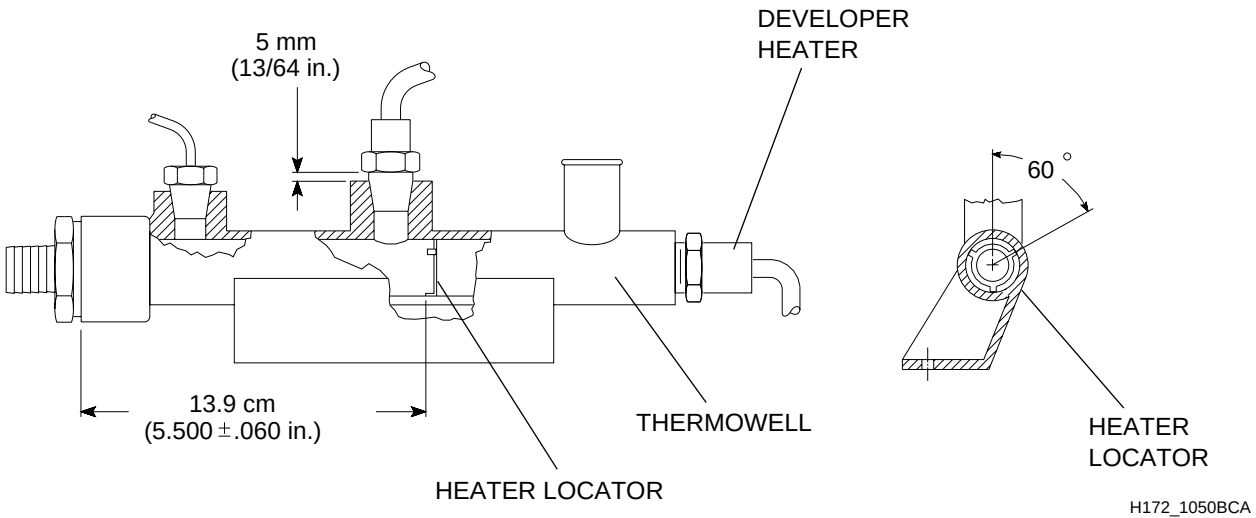
Warning
When you remove the DEVELOPER HEATER from the THERMOWELL, there might be a leakage of solution. Clean all spills.

[5] Remove:

- 2 SCREWS
- THERMOWELL
- DEVELOPER HEATER from the THERMOWELL

[6] Apply SEALANT TL-3230 to the THREADS on the new DEVELOPER HEATER.

[7] Insert the new DEVELOPER HEATER into the THERMOWELL.



[8] Use the HEATER LOCATOR on the THERMOWELL to check the correct location of the DEVELOPER HEATER.

Caution

Do not tighten the DEVELOPER HEATER excessively or you will cause damage to the THERMOWELL.

[9] Use your hand to tighten the DEVELOPER HEATER, then tighten the DEVELOPER HEATER an additional 1/2 rotation.

[10] Install the THERMOWELL using 2 SCREWS.

[11] Connect the wires of the DEVELOPER HEATER at TB2-9 and TB2-10.

[12] Close the ELECTRICAL BOX.

[13] Fill the DEVELOPER TANK or remove the CLAMPS from the TUBES on the THERMOWELL.

DEVELOPER THERMISTOR

Warning

Dangerous Voltage

[1] Disconnect the main power.

[2] Drain the DEVELOPER TANK or apply CLAMPS to the 2 TUBES on the THERMOWELL. See the Figure on Page 34.

ESD

Possible damage from electrostatic discharge.

[3] Open the ELECTRICAL BOX.

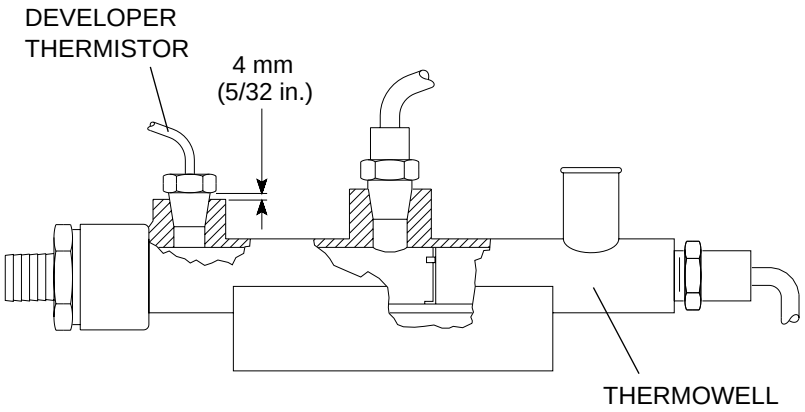
[4] Disconnect the wires of the DEVELOPER THERMISTOR at TB4-13 and TB4-14.

Warning

When you remove the DEVELOPER THERMISTOR from the THERMOWELL, there might be a leakage of solution. Clean all spills.

[5] Remove the DEVELOPER THERMISTOR from the THERMOWELL.

[6] Apply SEALANT TL-3230 to the THREADS on the new DEVELOPER THERMISTOR.



H172_1051BCA
H172_1051BA

Caution
You must install the DEVELOPER THERMISTOR at the correct distance from the THERMOWELL.

[7] Install the new DEVELOPER THERMISTOR 4 mm (5/32 in.) from the THERMOWELL.

[8] Connect the wires of the new DEVELOPER THERMISTOR at TB4-13 and TB4-14.

[9] Close the ELECTRICAL BOX.

[10] Fill the DEVELOPER TANK or remove the CLAMPS from the TUBES on the THERMOWELL.

DEVELOPER OVER-TEMPERATURE THERMOSTAT

Warning
Dangerous Voltage

[1] Disconnect the main power.

[2] Drain the DEVELOPER TANK or apply CLAMPS to the 2 TUBES on the THERMOWELL. See the Figure on Page 34.

ESD
Possible damage from electrostatic discharge.

[3] Open the ELECTRICAL BOX.

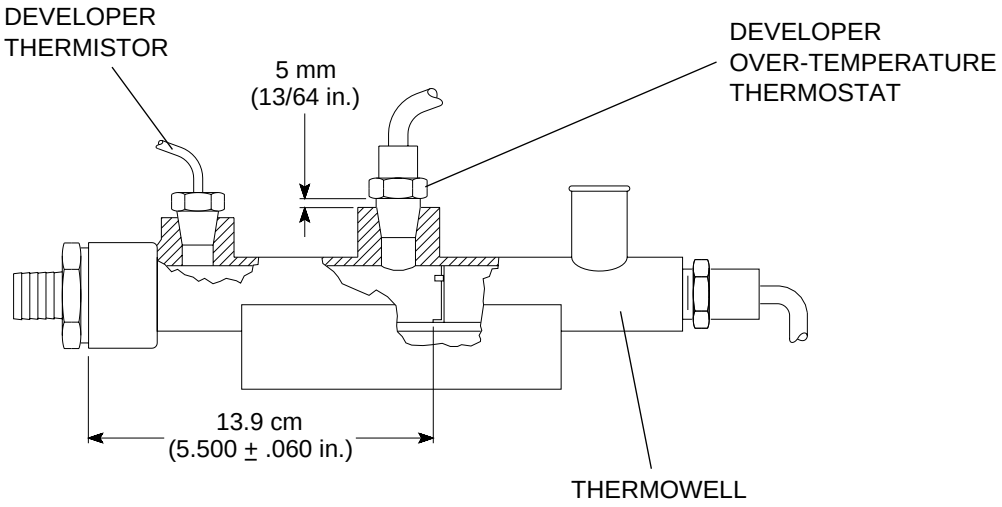
[4] Disconnect the wires of the DEVELOPER OVER-TEMPERATURE THERMOSTAT at:

- TB4-8
- TB4-9
- TB4-15
- TB4-16

Warning
When you remove the DEVELOPER OVER-TEMPERATURE THERMOSTAT from the THERMOWELL, there might be a leakage of solution. Clean all spills.

[5] Remove the DEVELOPER OVER-TEMPERATURE THERMOSTAT from the THERMOWELL.

[6] Apply SEALANT TL-3230 to the THREADS on the new DEVELOPER OVER-TEMPERATURE THERMOSTAT.



H172_1052BCA
H172_1052BA

Caution

You must install the DEVELOPER OVER-TEMPERATURE THERMOSTAT at the correct distance from the THERMOWELL.

[7] Install the new DEVELOPER OVER-TEMPERATURE THERMOSTAT 5 mm (13/64 in.) from the THERMOWELL.

[8] Connect the wires of the new DEVELOPER OVER-TEMPERATURE THERMOSTAT to:

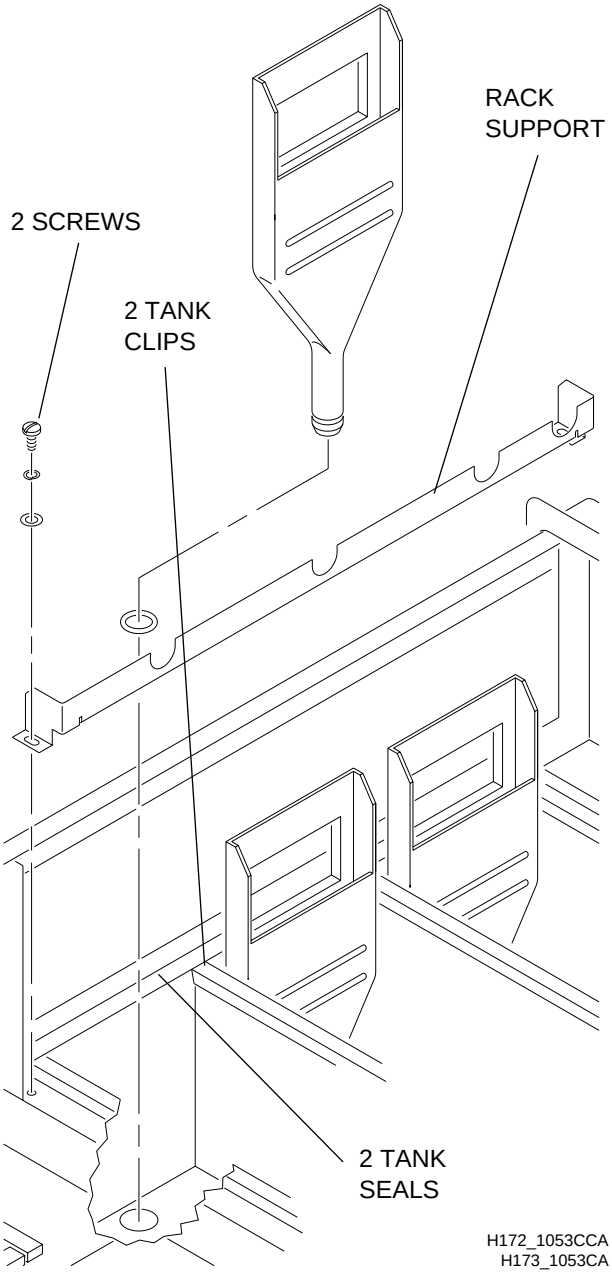
- TB4-8
- TB4-9
- TB4-15
- TB4-16

[9] Close the ELECTRICAL BOX.

[10] Fill the DEVELOPER TANK or remove the CLAMPS from the TUBES on the THERMOWELL.

HEAT EXCHANGER

Purpose: Use this procedure for the replacement of the HEAT EXCHANGER for the FIXER TANK or the WASH TANK.



Warning
Dangerous Voltage

[1] Disconnect the main power.

[2] Disconnect the water supply to the PROCESSOR.

[3] Remove:

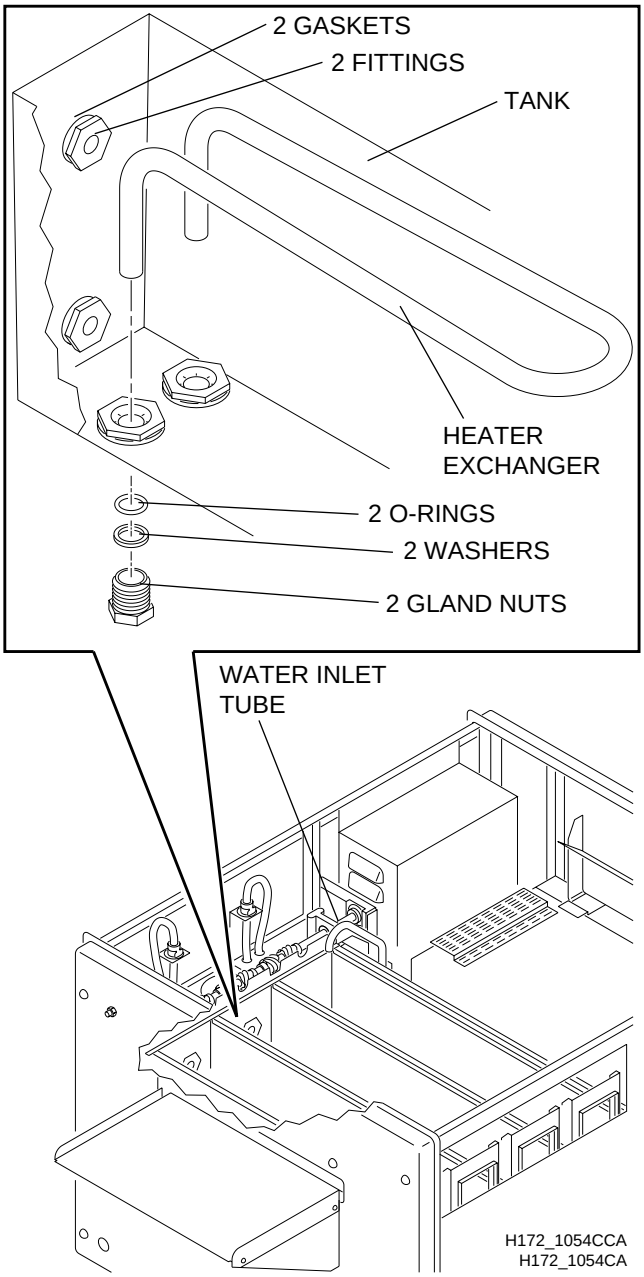
- TOP COVER
- 2 SIDE PANELS

[4] Drain the 3 TANKS.

[5] Remove:

- 2 SCREWS
- RACK SUPPORT
- TANK SEALS
- TANK CLIP

[6] Disconnect all TUBING from the TANK.



[7] Remove if necessary:

- 2 FITTINGS
- WATER INLET TUBE

[8] To remove the TANK, lift the non-drive side of the TANK first.

[9] Remove from the TANK:

- 2 GLAND NUTS
- 2 O-RINGS
- 2 WASHERS
- HEAT EXCHANGER

Important

Use new GASKETS if you are installing a FIXER TANK.

[10] Install:

- new HEAT EXCHANGER
- 2 O-RINGS
- 2 WASHERS
- 2 GLAND NUTS
- TANK
- 2 FITTINGS
- 2 GASKETS
- WATER INLET TUBE
- TANK SEALS
- TANK CLIP
- TUBING
- RACK SUPPORT

[11] Move the RACK SUPPORT toward the non-drive side of the PROCESSOR.

[12] Install the 2 SCREWS.

[13] Fill the TANKS with water.

[14] Check for leakage.

[15] Drain the water from the DEVELOPER TANK and the FIXER TANK.

[16] Fill the DEVELOPER TANK and the FIXER TANK with the correct solution.

[17] Connect the water supply.

Warning

Dangerous Voltage

[18] Connect the main power.

RECIRCULATION PUMP

Warning
Dangerous Voltage

[1] Disconnect the main power.

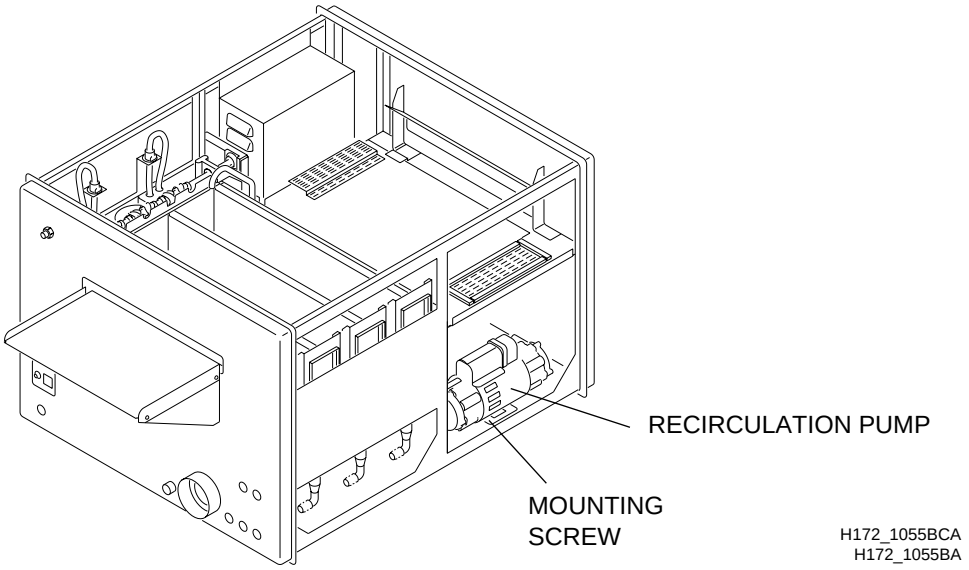
[2] Disconnect the water supply to the PROCESSOR.

[3] Remove:

- TOP COVER
- 2 SIDE PANELS

[4] Drain the 3 TANKS.

[5] Install PINCH CLAMPS on the TUBING to the RECIRCULATION PUMP to prevent leakage of solution.



[6] Disconnect the TUBING to the RECIRCULATION PUMP.

[7] Remove:

- MOUNTING SCREWS
- RECIRCULATION PUMP
- MOTOR LEADS (not visible in figure)

[8] Install:

- new RECIRCULATION PUMP
- MOTOR LEADS (not visible in figure)
- MOUNTING SCREWS

[9] Connect the TUBING to the RECIRCULATION PUMP.

[10] Connect the water supply.

[11] Remove the PINCH CLAMPS from the TUBING.

[12] Fill the 3 TANKS with water.

Warning
Dangerous Voltage

[13] Connect the main power.

Caution

Do not operate the RECIRCULATION PUMP if the TANKS are empty.

[14] Actuate the RECIRCULATION PUMP.

[15] Check for:

- agitation of the water in the TANK
- leakage

[16] Drain the water from the DEVELOPER TANK and the FIXER TANK.

[17] Fill the DEVELOPER TANK and the FIXER TANK with the correct solution.

O-RING in the RECIRCULATION PUMP

Warning

Dangerous Voltage

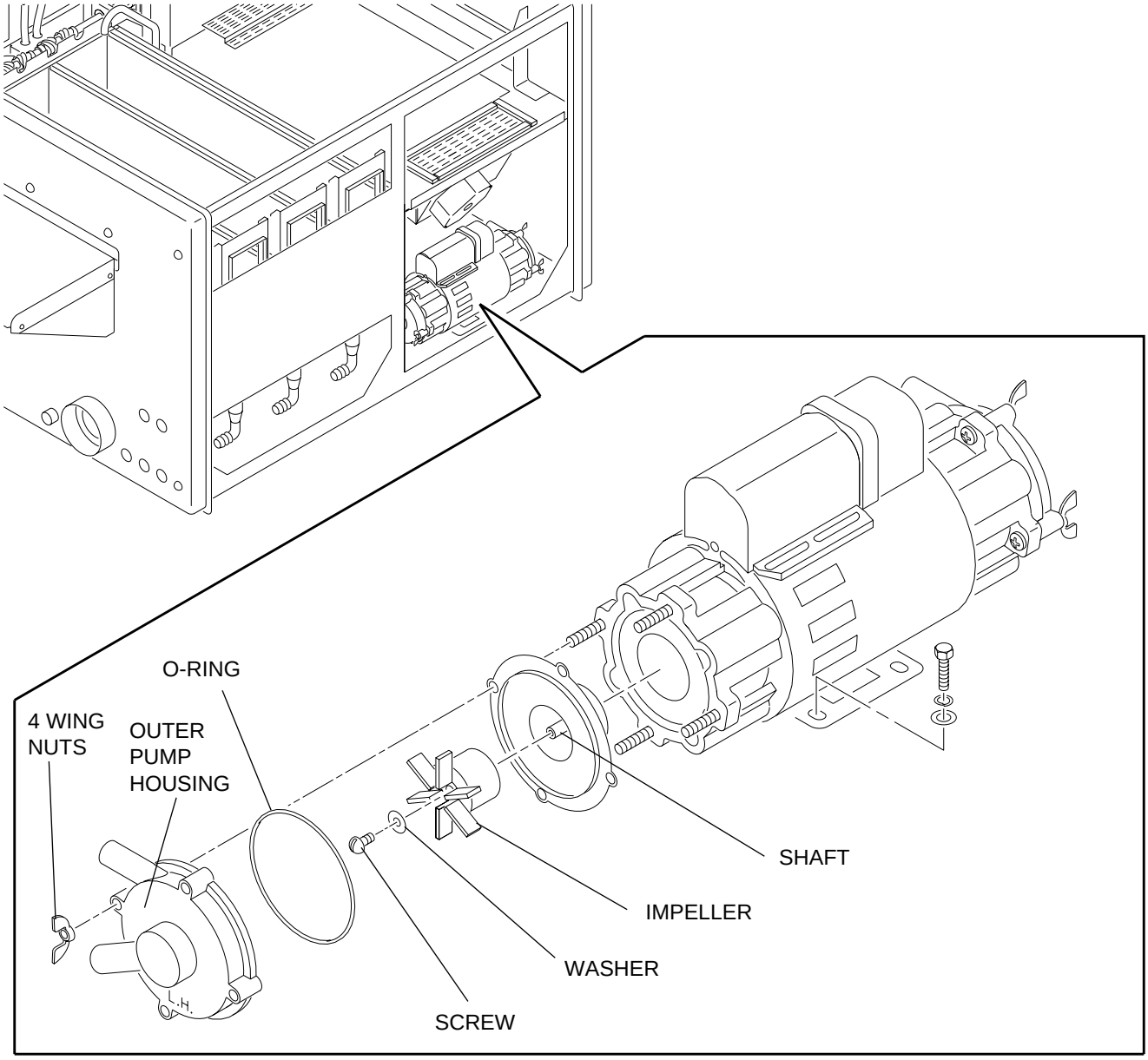
[1] Disconnect the main power.

[2] Disconnect the water supply to the PROCESSOR.

[3] Remove:

- TOP COVER
- 2 SIDE PANELS

[4] Install PINCH CLAMPS on the TUBING to the RECIRCULATION PUMP to prevent leakage of solution.



H172_1056DCA
H172_1056DA

[5] Remove:

- 4 WING NUTS
- OUTER PUMP HOUSING
- O-RING

Important

The new O-RING must seat correctly.

[6] Install:

- O-RING
- OUTER PUMP HOUSING
- 4 WING NUTS

[7] Remove the PINCH CLAMPS from the TUBING.

Warning
Dangerous Voltage

[8] Connect the main power.

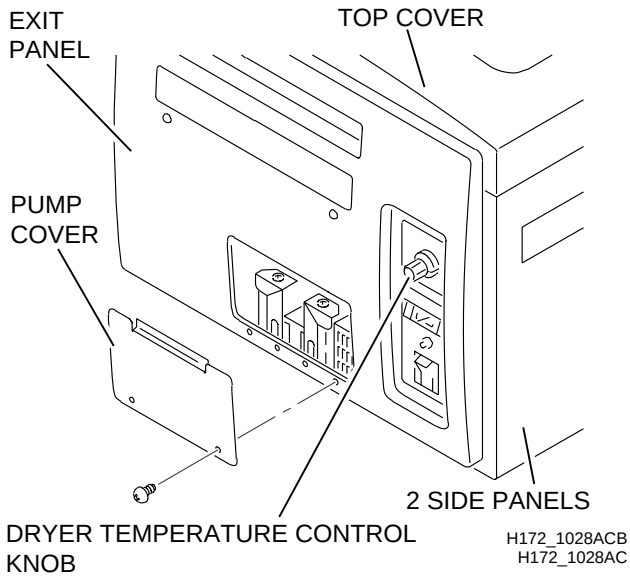
Caution
Do not operate the RECIRCULATION PUMP if the TANKS are empty.

[9] Actuate the RECIRCULATION PUMP.

[10] Check for:

- agitation of the solution in the TANK
- leakage

REPLENISHMENT PUMP



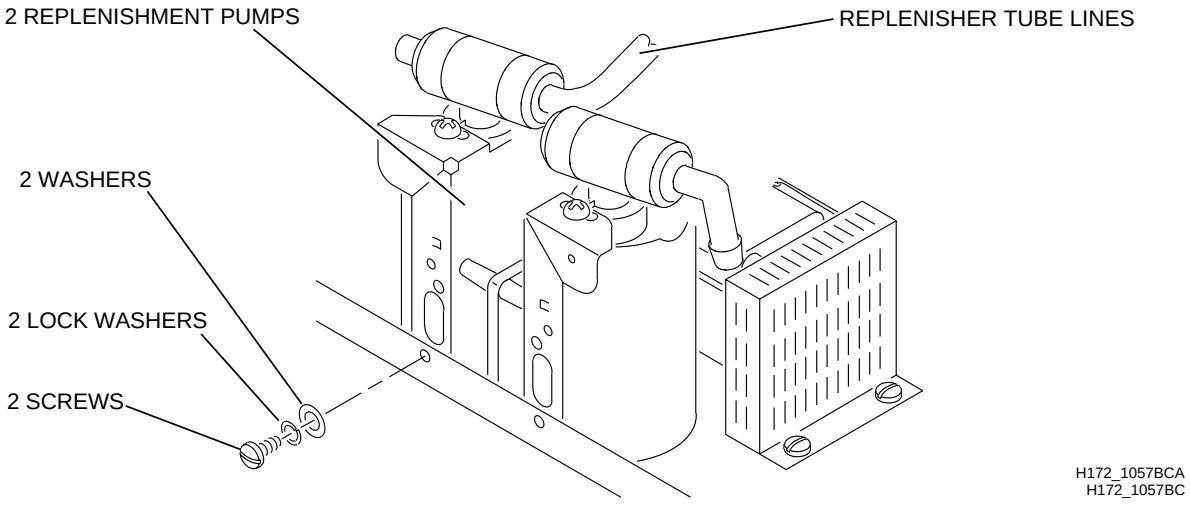
Warning
Dangerous Voltage

[1] Disconnect the main power.

[2] Disconnect the water supply to the PROCESSOR.

[3] Remove:

- TOP COVER
- 2 SIDE PANELS
- RECEIVING BIN
- DRYER TEMPERATURE CONTROL KNOB
- PUMP COVER
- EXIT PANEL



[4] Disconnect:

- MOTOR LEAD TB3-6
- MOTOR LEAD TB3-2
- GROUND WIRE

[5] Install PINCH CLAMPS on the TUBING to the REPLENISHMENT PUMP.

[6] Disconnect the REPLENISHER TUBE LINES.

[7] Remove:

- 2 SCREWS
- 2 LOCK WASHERS
- 2 WASHERS
- REPLENISHMENT PUMP

[8] Reverse the steps to install a new REPLENISHMENT PUMP.

Section 3: Periodic Maintenance

Procedure and Schedule

Important

The Periodic Maintenance procedures include additional procedures which are not in the OPERATOR MANUAL, Publication No. 7C8770. For optimum operation of the PROCESSOR, it is important to do these procedures.

[1] Process 5 sheets of unprocessed film.

[2] Check the film for artifacts.

[3] Do all of the Monthly Maintenance Procedures first.

[4] Do the procedure for lubrication on Page 53.

[5] Check the specifications of the site.

[6] Process 5 sheets of film.

[7] Check the film for artifacts.

Monthly Maintenance Procedures

DETECTOR SWITCHES

[1] Check that the DETECTOR SWITCHES operate the REPLENISHMENT PUMP.

[2] Adjust the DETECTOR SWITCHES if necessary. Use the procedure on Page 5.

DETECTOR CROSSOVER AY

[1] Use a damp, lint-free CLOTH or a SPONGE to clean the DETECTOR ROLLERS.

[2] Check:

- ROCKER ARM moves freely
- ROCKER ARM does not have corrosion
- DETECTOR CROSSOVER AY for squareness

[3] Clean the ROCKER ARM if it does not move freely.

[4] Install a new ROCKER ARM if it has corrosion.

[5] Check the DETECTOR CROSSOVER AY for squareness. Use the procedure on Page 7.

[6] Check that the DETECTOR CROSSOVER AY is correctly seated.

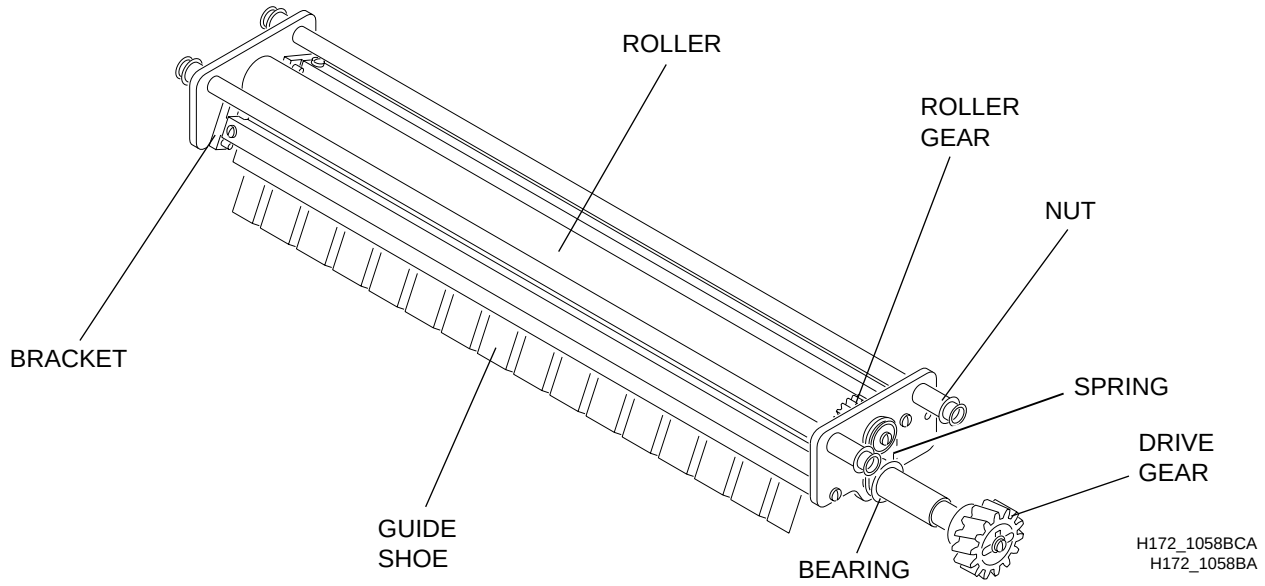
CROSSOVER AYs

[1] Remove the CROSSOVER AYs from the PROCESSOR.

[2] Rinse the CROSSOVER AYs with water.

[3] Use warm water and a soft BRUSH to clean the CROSSOVER AYs, or use:

Cleaning Solution	Type of CROSSOVER
DEVELOPER SYSTEM CLEANER and NEUTRALIZER, Catalog No. 843 4615	DEVELOPER/FIXER CROSSOVER
FIXER/WASH SYSTEM CLEANER, Catalog No. 139 5110	FIXER/WASH CROSSOVER



[4] Check that the surface of the RESILIENT ROLLER is smooth. Install a replacement if necessary.

[5] Check components for wear or broken parts. Install replacements if necessary:

- SPRINGS
- ROLLER GEARS
- BEARING
- BRACKET
- NUTS
- DRIVE GEAR

[6] Check the CROSSOVER AYs for squareness. Use the procedure on Page 7.

RACK AYs

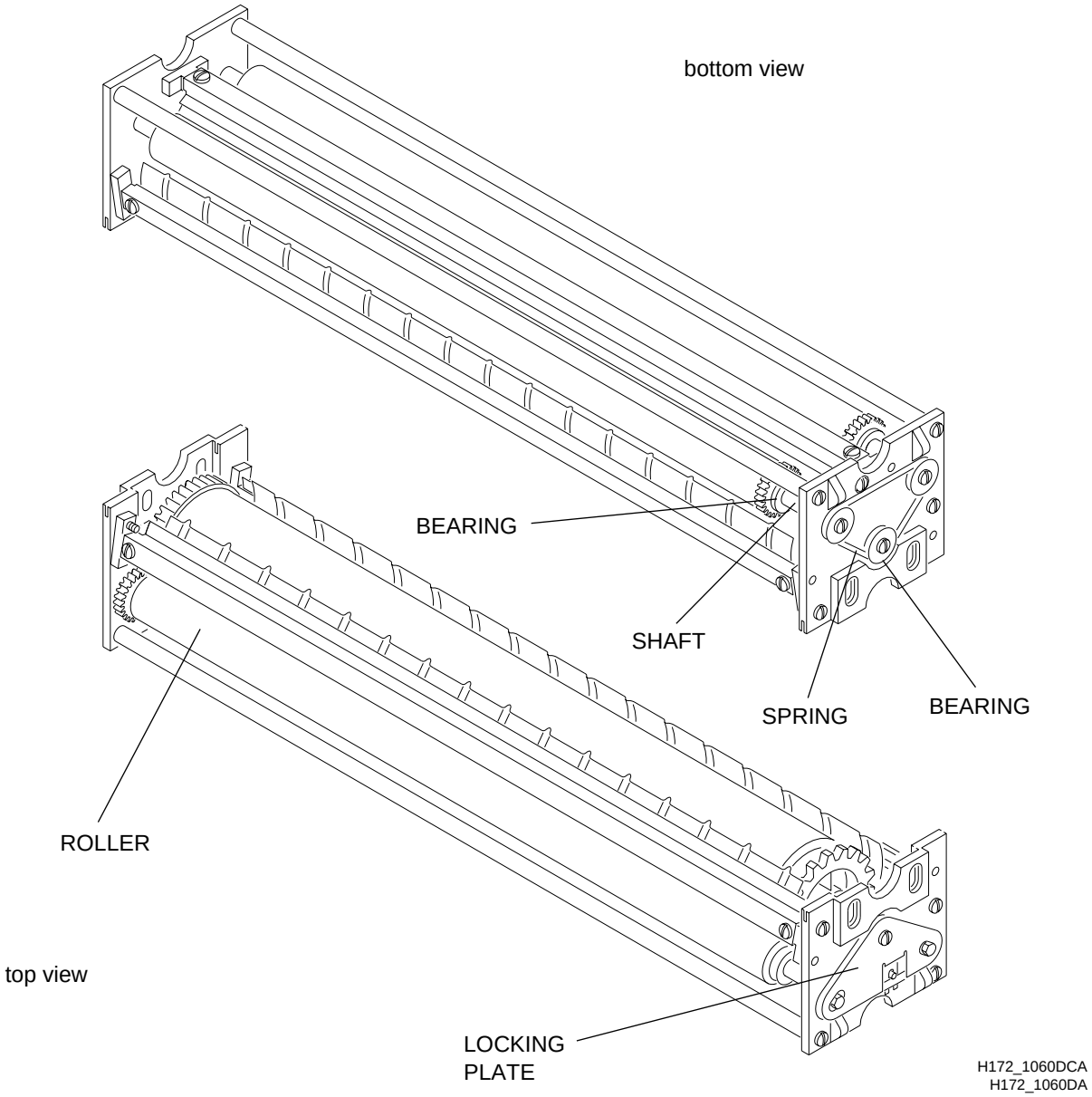
[1] Remove the RACKS from the PROCESSOR.

[2] Rinse the RACKS with warm water.

[3] Use warm water and a soft BRUSH to clean the RACKS, or use:

Cleaning Solution	RACK
DEVELOPER SYSTEM CLEANER and NEUTRALIZER, Catalog No. 843 4615	DEVELOPER
FIXER/WASH SYSTEM CLEANER, Catalog No. 139 5110	FIXER
	WASH

Note
The ROLLERS might change color with time. This change is normal.

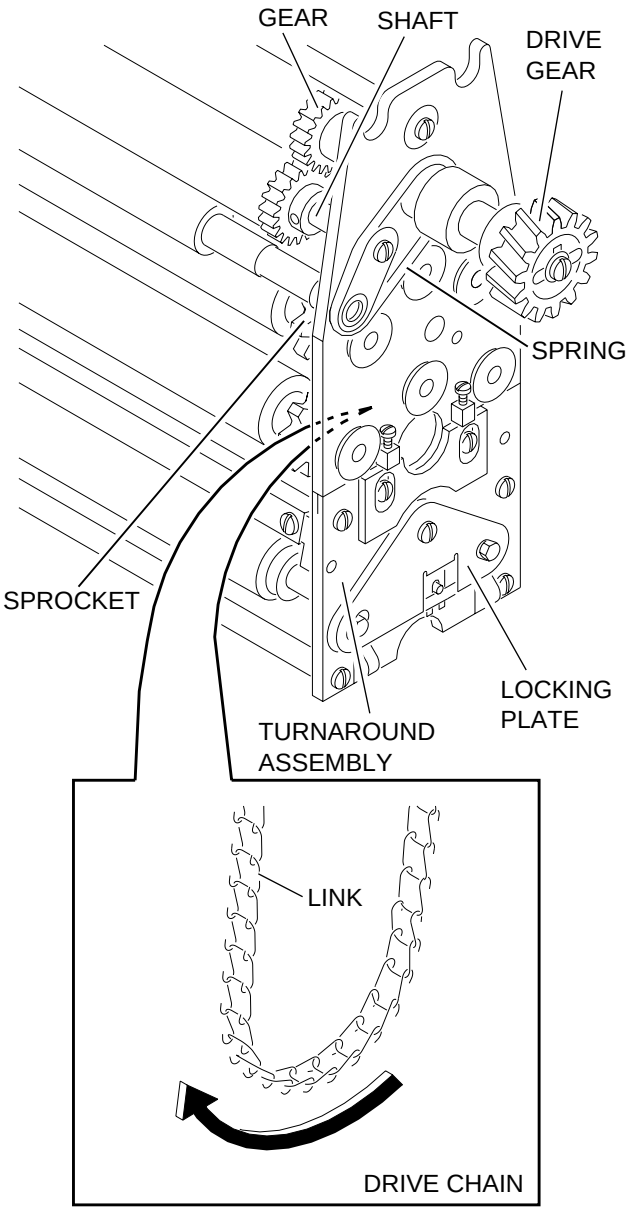


[4] Check:

- SPRINGS for correct tension and for wear
- ROLLERS and BEARINGS rotate freely
- ROLLERS move freely in the LOCKING PLATES
- surfaces of the ROLLERS are smooth

[5] Install replacement SPRINGS and ROLLERS if necessary.

DRIVE CHAIN



H172_1041CCB
H172_1041CA

[6] Manually rotate the DRIVE GEAR to check the LINKS of the DRIVE CHAIN.

Important

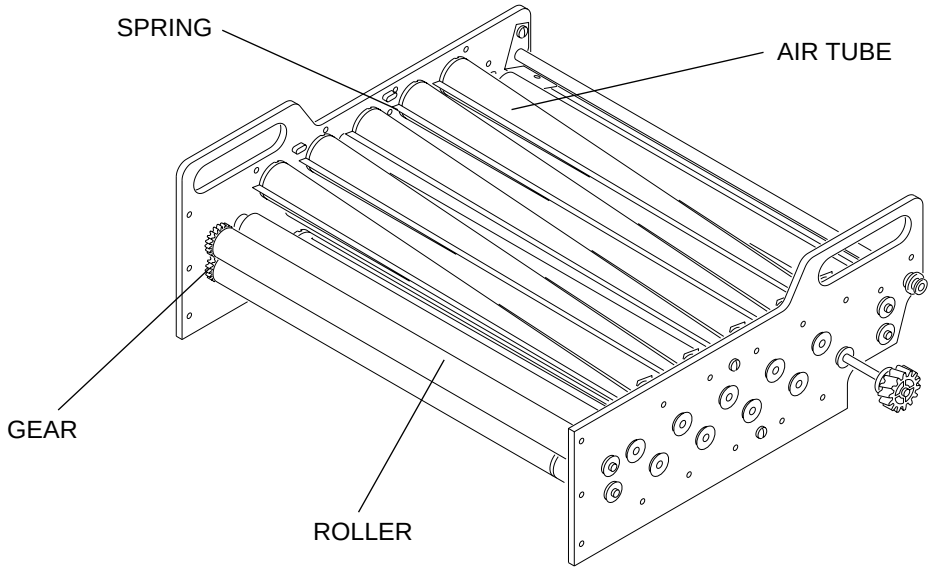
The tension of the DRIVE CHAIN must be correct.

- If the DRIVE CHAIN is too tight, the ROLLERS will bind and cause wear of the BEARING.
- If the DRIVE CHAIN is too loose, the ROLLERS will not move smoothly.

[7] Check the tension of the DRIVE CHAIN.

[8] If necessary, adjust the tension of the DRIVE CHAIN using the procedure on Page 10.

DRYER



H172_1059BCA
H172_1059BA

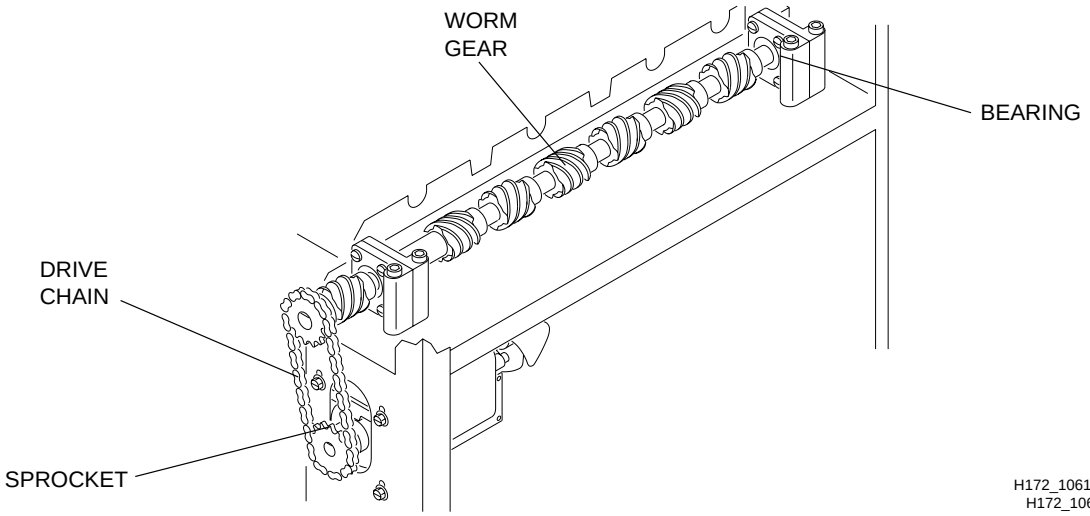
[1] Remove the DRYER RACK from the PROCESSOR.

[2] Check for broken GEARS and install new ROLLERS if necessary.

[3] Check the SPRINGS, not visible in the graphic, for correct tension and for wear. Install new SPRINGS if necessary.

[4] Check and adjust the temperature of the DRYER. Use the procedure on Page 24.

MAIN DRIVE



H172_1061BCA
H172_1061BA

[1] Check the DRIVE CHAIN for wear and install a new DRIVE CHAIN if necessary.

[2] Check and adjust the tension of the DRIVE CHAIN. Use the procedure on Page 21.

[3] Lubricate the DRIVE CHAIN if necessary. Use the procedure on Page 53.

[4] Check for wear and install replacements if necessary:

- BEARINGS
- SPROCKETS
- WORM GEARS

[5] Check the TEETH of the SPROCKETS. If the TEETH are sharp, install new SPROCKETS.

[6] Check the WORM GEARS for burrs. Install new WORM GEARS if necessary.

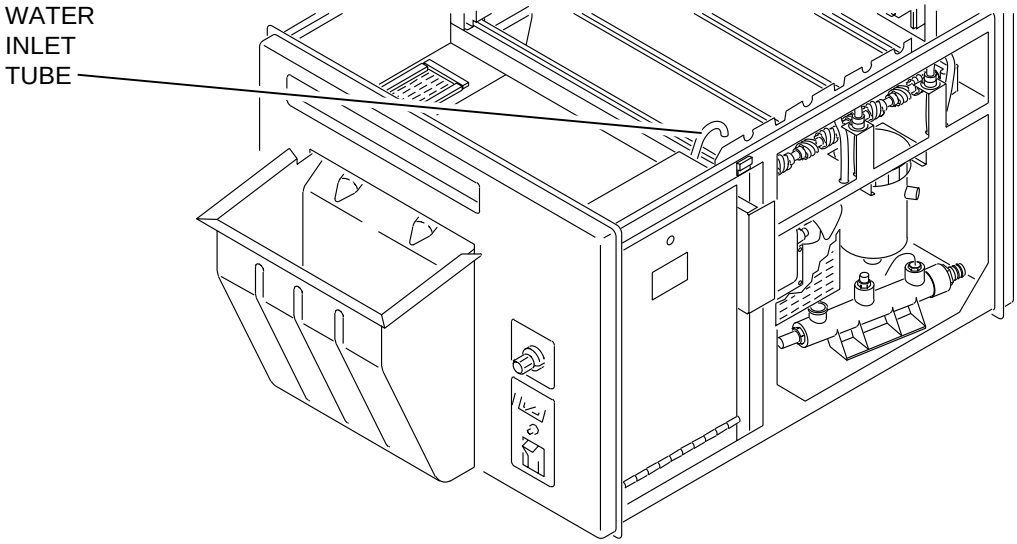
[7] Rinse the WORM GEARS with warm water.

PLUMBING

[1] Check components and connections for leakage:

- RECIRCULATION PUMPS
- VALVES
- TUBING
- TANKS

[2] Check that the temperature of the water supply is 4-30°C (40-85°F).



H172_1062BCA
H172_1062BC

[3] Check the flow rate of the water supply:

(a) Drain the TANKS.

(b) Remove:

- FIXER/WASH CROSSOVER
- DRYER RACK
- WASH RACK

(c) Start the water supply.

(d) Measure the flow rate at the WATER INLET TUBE. The rate should be 946 mL/min. (1/4 gal/min.), +10%, -0%.

RECIRCULATION PUMPS

Caution

Do not operate the RECIRCULATION PUMP if the TANKS are empty.

[1] Actuate the RECIRCULATION PUMPS.

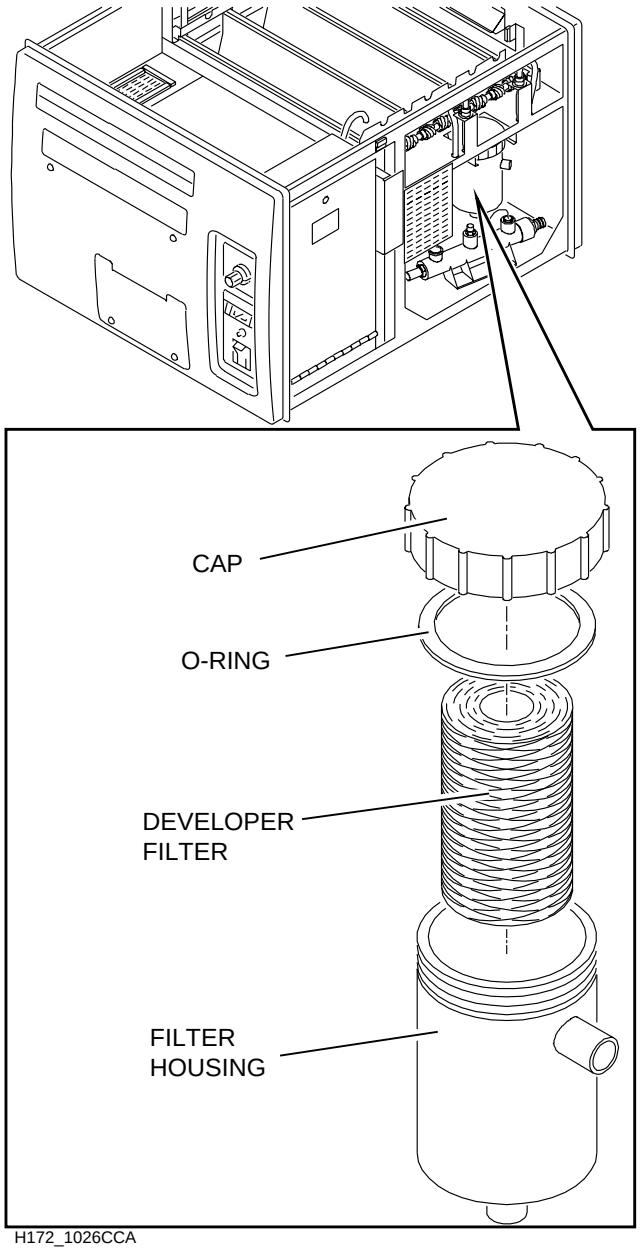
[2] Check for:

- leakage
- agitation of the solution in the TANKS
- excessive noise from the RECIRCULATION PUMPS

DEVELOPER FILTER

Important

Install a new DEVELOPER FILTER monthly or after approximately 1000 sheets of film have been processed.



H172_1026CCA
H172_1026CC

[1] Soak the new DEVELOPER FILTER in warm water for 30 seconds.

[2] Remove the FILTER AY.

[3] Lift the FILTER AY above the level of the solutions.

Note

Keep the FILTER AY above the level of the solutions during the procedure to prevent draining the solutions from the TANKS.

[4] Disassemble:

- FILTER HOUSING
- DEVELOPER FILTER
- O-RING
- CAP

Important

The O-RING must be seated correctly.

[5] Assemble:

- FILTER HOUSING
- new DEVELOPER FILTER
- O-RING
- CAP

[6] Install the FILTER HOUSING in the PROCESSOR.

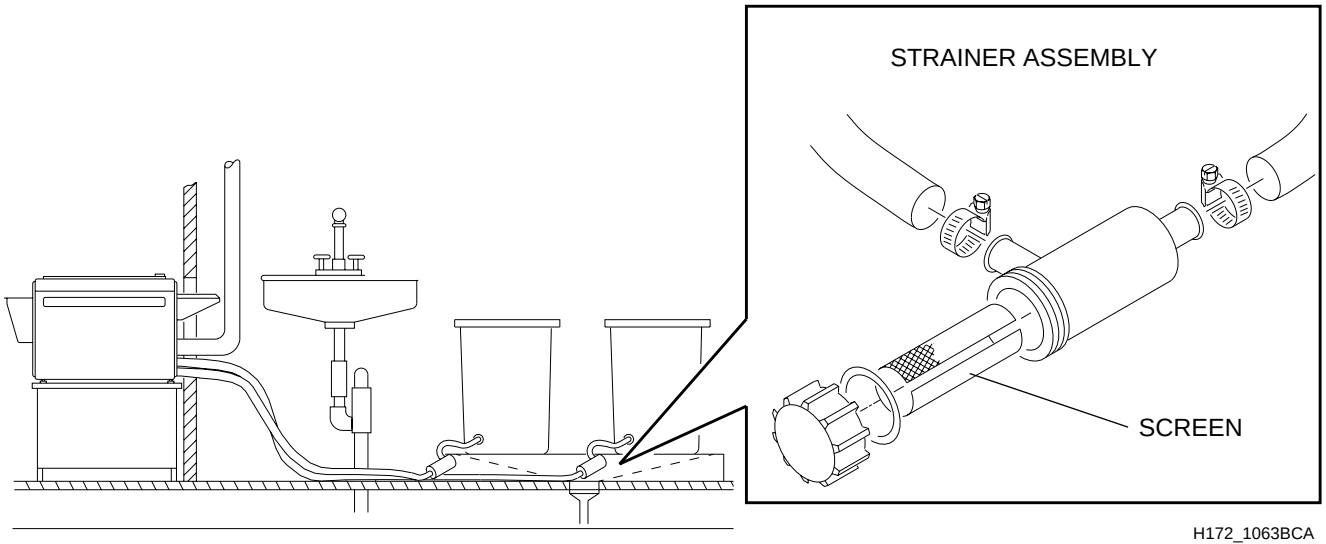
[7] Check that the TUBING connected to the FILTER HOUSING is not bent.

Temperature of the Developer Solution

[1] Do the procedure on Page 29.

Chemical Replenishment

[1] Check the replenishment rates. Use the procedure on Page 31.



H172_1063BCA
H172_1063BA

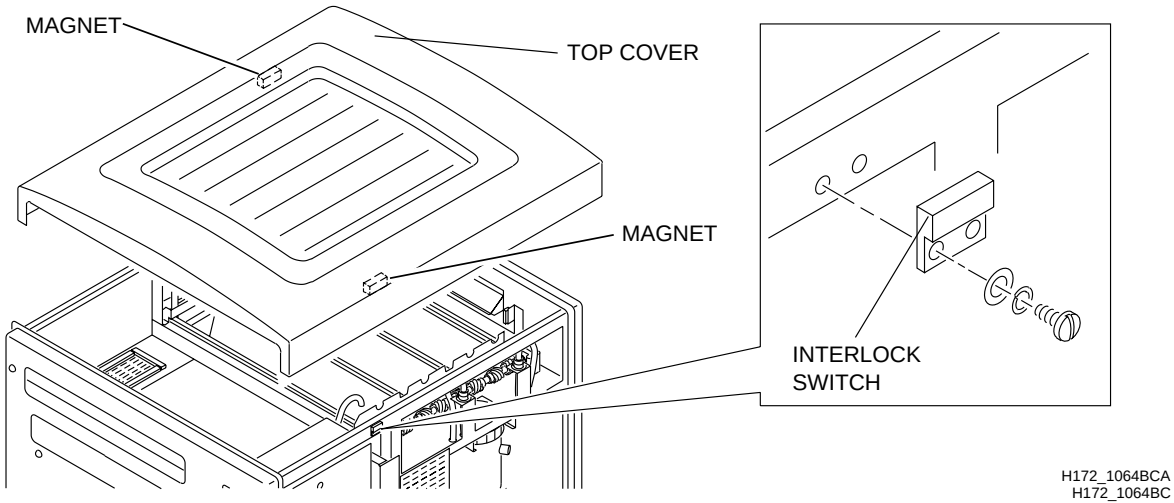
[2] Check the STRAINERS for debris:

(a) Place CLAMPS on the TUBING to stop the flow of replenishment solution.

(b) Disassemble the STRAINER AYs.

(c) Use a BRUSH and warm water to clean the STRAINER AYs and the SCREENS.

INTERLOCK SWITCH



H172_1064BCA
H172_1064BC

[1] Press the RUN/STANDBY SWITCH.

Warning
Moving Parts

[2] Remove the TOP COVER.

[3] Check that the components stop operating:

- MAIN DRIVE MOTOR
- BLOWER MOTOR
- DRYER HEATER

[4] If the components do not stop when the TOP COVER is removed, install a new INTERLOCK SWITCH.

Lubrication Procedure and Schedule

Warning
Dangerous Voltage

[1] Disconnect the main power before applying lubrication to the PROCESSOR.

Caution
Do not allow lubricants to touch the CROSSOVERS or RACK ASSEMBLIES, or to drip into the TANKS.

[2] Apply lubricant to the parts identified in the Table:

Part	Frequency of Lubrication	Lubricant	Procedure
MAIN DRIVE CHAIN	As necessary, check monthly	NLGI - No. 2 LITHIUM BALL AND ROLLER BEARING GREASE TL-2324	Apply to the surface of the CHAIN.
RECIRCULATION PUMPS	Every 6 months	LIGHT OIL Example: SAE No. 20 MOTOR OIL TL-2244	Apply drops of OIL in the OIL HOLES.
DRYER BLOWER BEARINGS	Every 6 months	LIGHT OIL Example: SAE No. 20 MOTOR OIL TL-2244	Apply drops of OIL in the OIL HOLES.
MAIN DRIVE MOTOR	No lubrication is necessary		
GEAR HOUSING of the MAIN DRIVE MOTOR	No lubrication is necessary		

Section 4: Correcting Problems

1	2	3	4	5	6	
						1. Transport Failure
						2. Surface Artifacts
						3. Abnormal Film Densities
						4. Wet Films
						5. Low Solution Levels
						6. Overlapping of Films
•					•	Film Feeding Error Feed only single thicknesses of film. Feed the next film only after the film feed signal sounds If there is no film feed signal, refer the difficulty to qualified service personnel.
•	•	•	•			Feed only compatible films.
•					•	Check that all RACKS and CROSSOVERS are seated correctly.
•	•					Check that the surfaces of all the ROLLERS are clean and smooth, especially in the DEVELOPER TURNAROUND AY.
•			•			Check that the DRYER AIR TUBES are in the correct positions.
	•		•			Remove any dirt from the DRYER ROLLERS and AIR TUBES, especially the slots. Use a bottle brush and rinse with water.
	•	•	•	•		Check that the replenishment settings are correct.
	•					Adjust the DRYER temperature control setting to the **lowest** possible temperature that still allows good drying.
	•					Clean the FEED SHELF and DETECTOR ROLLERS
•	•				•	Clean any biological growth in the WASH TANK with a mild solution of chlorine bleach. Use 60 mL (2 fl oz) of bleach per 3.8 L (1 gallon) of water. Wipe the TANKS with a soft sponge.
•				•		Check that the WEIRS are seated correctly. Check that the TANKS are full.
•	•	•	•		•	Change any chemicals that were not mixed correctly, are exhausted, or are contaminated. Check that the replenishment flow rates are correctly set. Fill the Replenishment TANKS if necessary.
•	•				•	Check that all ROLLERS are in place and positioned and rotating correctly.
•	•				•	Check that all ROLLER GEARS, SPROCKETS, and IDLERS are engaged.
•	•				•	Replace any ROLLER that has a broken or worn GUDGEONS.
•	•				•	Replace any BEARINGS that do not allow the TURNAROUND ROLLERS to rotate correctly.
•	•					Check the tension on the RACK CHAIN. Check that the ROLLERS do not hesitate and that the CHAIN moves smoothly.
		•				With the PROCESSOR energized, check for movement on the surface of the solutions. Movement indicates recirculation.
•	•					If the incoming wash water is dirty, clean the RACK and TANK thoroughly. Change the incoming WATER FILTER. Make sure to use the correct WATER FILTER.
			•			Check that the DRYER AIR EXHAUST is free from any obstruction.
•					•	Check that the TURNAROUND ASSEMBLY is adjusted correctly. Make sure that the TURNAROUND ASSEMBLIES are square with the RACKS.

1. Transport Failure	2. Surface Artifacts	3. Abnormal Film Densities	4. Wet Films	5. Low Solution Levels	6. Overlapping of Films	
1	**2**	**3**	**4**	**5**	**6**	
	•	•				Check the incoming water temperature. Temperature must be between 4.4°C (40°F) and 29.4°C (85°F).
		•				Check that the correct BULB and SAFELIGHT FILTER are in the SAFELIGHT and at the correct distance from the FEED SHELF and work surface.
•		•				Check that the TOP COVER and PANELS are tight on the PROCESSOR. Check that there are no leaks in the LIGHTTIGHT GASKET.
•						10 x 10 cm films - feed films diagonally if they fail to transport reliably.
					•	Check the time delay. For all transport speeds, the BUZZER should sound once the trailing edge of the film has advanced 75 mm (3 in.) into the PROCESSOR.
•	•	•			•	Check that the solution levels of the TANKS are at the overflow WEIRS.
				•		Check for solution in the REPLENISHMENT TANKS. Fill if necessary. NOTE: Mix developer replenisher in quantities not to exceed a 2-week supply.
		•				With a THERMOMETER of known accuracy, check that the temperature of the developer is correct. If necessary, have qualified service personnel make adjustments. NOTE: Check the incoming water temperature. It must be a minimum of 4°C (7°F) lower than the desired developer temperature.

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